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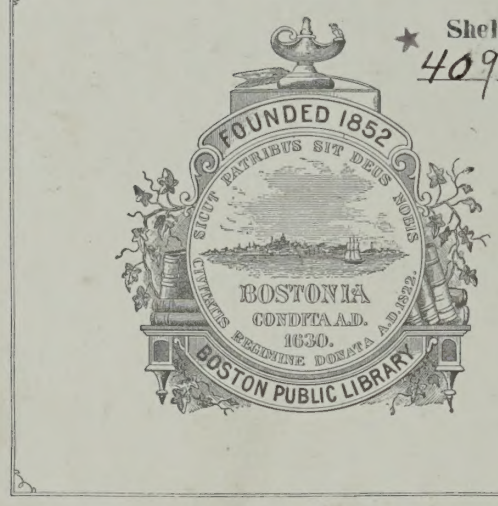

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SCIENTIFIC AMERICAN.

Building Edition.

A RESIDENCE AT OVERBROOK, PA.

No 128. JUNE 1896.

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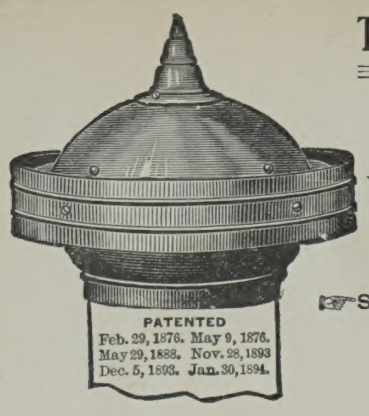

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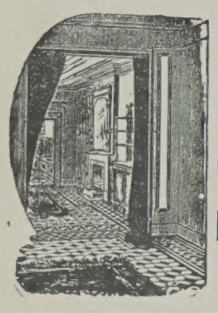

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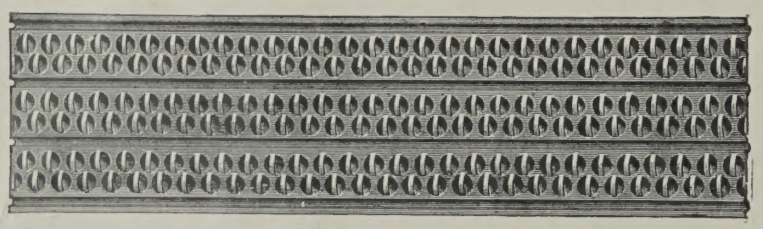

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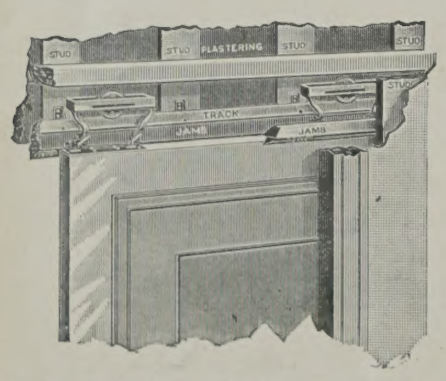

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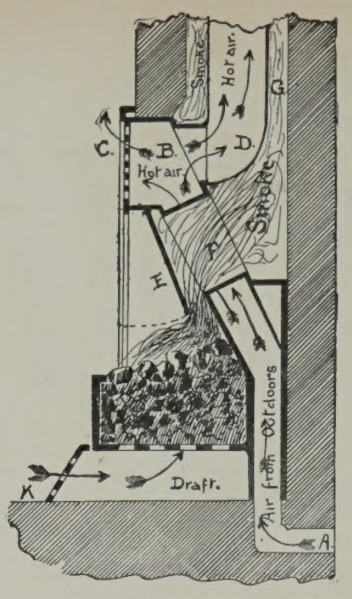

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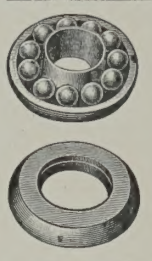

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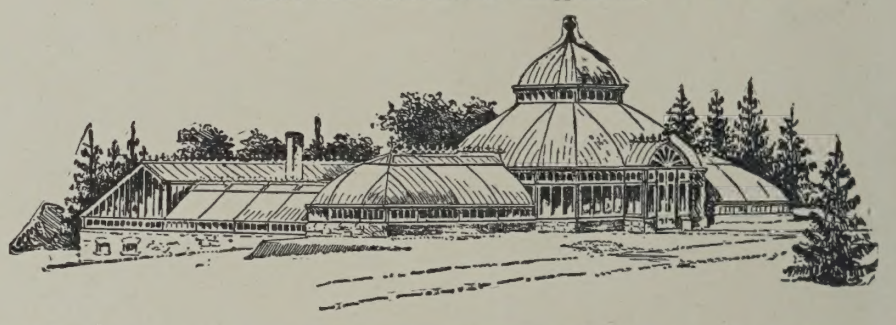

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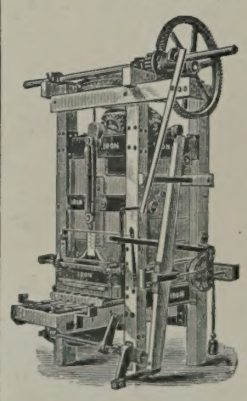

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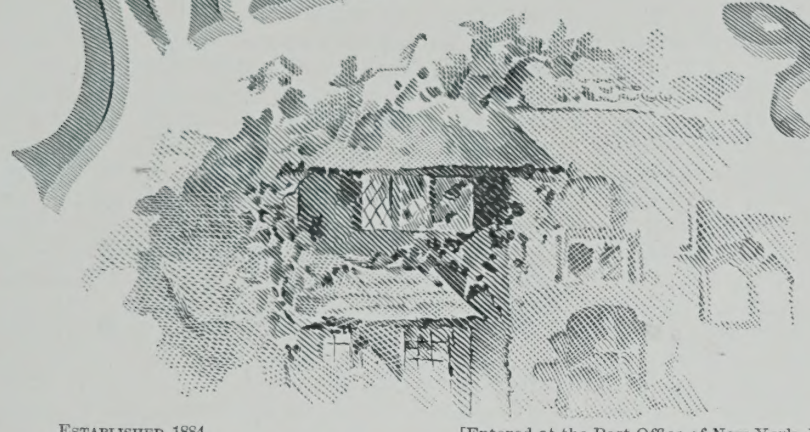

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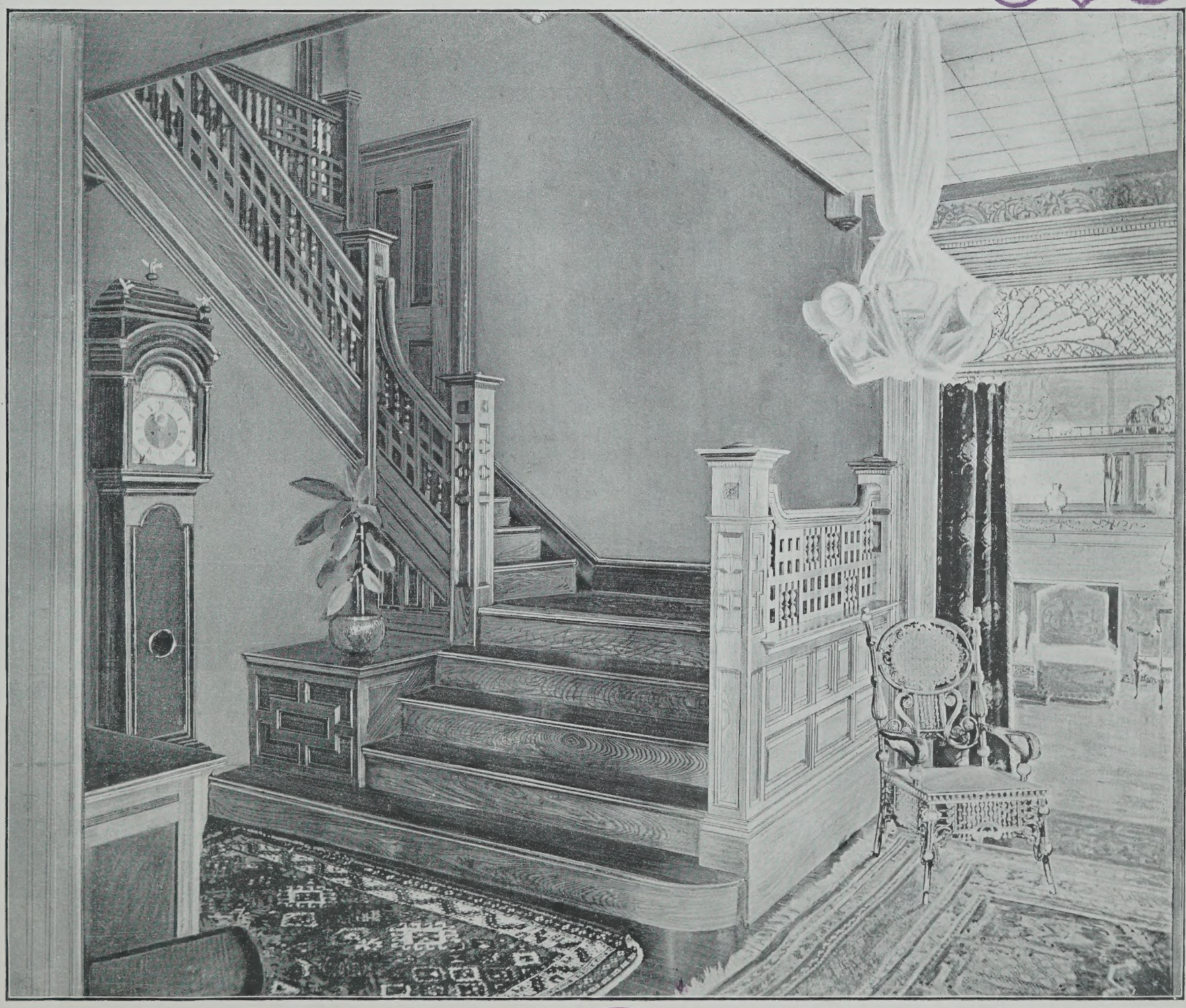

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A RESIDENCE AT ORANGE, N. J.—See page 2.

Scientific American.

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NEW YORK, JANUARY, 1896.

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SCIENTIFIC AMERICAN, BUILDING EDITION.

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A RESIDENCE AT ORANGE, N. J.

On pages 1, 4, and 5 we present a residence erected recently for Henry H. Truman, Esq., at Highland Avenue, Orange, N. J. The building is situated on a corner site, and the design is imposing and appropriate to the location. The first story is built of broken ashlar brownstone, above which point the building is frame, and the exterior walls are covered with shingles and clapboards. The color scheme is in dark green and red, making a pleasing contrast with the light stonework. The roof is covered with dark slates. Dimensions: Front, 41 ft.; side, 49 ft., not including porch. Height of ceilings: Cellar, 7 ft.; first story, 9 ft. 6 in.; second, 9 ft.; third, 8 ft. 6 in. The first story consists of large centre hall, communicating with the drawing-room at the right, and the library and dining-room at the left, with a spacious kitchen at rear, to which indirect communication is had by butler's pantry. Hall is trimmed with antique oak, and it has an oak floor, highly polished, an open fireplace built of brick, with tiled brick hearth and facings and an oak mantel, and a staircase, paneled, and provided with a carved newel. Drawing-room is finished with sycamore. It has an open fireplace, trimmed with tiles and provided with an elegant carved mantel. Library and dining-room are trimmed with oak, and have hardwood floors, the former having an open fireplace. The doorways are furnished with ornamental spindle transoms. Kitchen and pantries are trimmed and wainscoted with yellow pine, and furnished with the usual fixtures. A flight of back stairs is provided from kitchen to second floor, containing five chambers, and to third floor, containing four large rooms. These two floors are trimmed with whitewood, finished natural. The second story contains, also, large closets and bathroom, wainscoted, and fitted up in the best possible manner with exposed plumbing. Servants' toilet and laundry, and also furnace and other necessary apartments, are provided in the basement. There are bath accommodations on the third floor. Approximate cost, $12,000. Mr. Frank W. Beall, architect, No. 825 Monadnock Block, Chicago, Ill.

Our engravings were made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.

A COLONIAL RESIDENCE AT SPRINGFIELD, MASS.

We present on pages 3 and 6 a dwelling, Colonial in treatment, which has been recently erected for W. S. Scott, Esq., at Springfield, Mass. The design is treated in an artistic manner, and the main lines are well broken by several bay windows, and the roof lines are ornamented by dormers. One of the excellent features is the spacious piazza, part of which is not covered, thereby admitting light and sunshine to the principal apartments on first floor. The foundation is built of stone. The underpinning is built of brick. The exterior framework is sheathed, shingled, and left to weather finish, while the trimmings are painted white. Roof, shingled and finished similar. Dimensions: Front, 30 ft. 6 in.; side, 49 ft. 6 in., not including piazza. Height of ceilings: Cellar, 7 ft.; first story, 9 ft. 6 in.; second, 9 ft.; third, 8 ft. 6 in. Vestibule is paneled with oak, and the floor is paved with tiles. Hall is trimmed with oak. It has a paneled wainscoting, and an ornamental staircase, with fluted pilasters extending to ceiling and elegantly carved. This staircase is turned out of similar oak, and a latticed window with paneled seat is thrown out at first landing. The floors are laid with oak and highly polished. The parlor is trimmed with whitewood, and then painted China white in a dainty manner. Library is trimmed with sycamore, and is provided with an open fireplace, built of brick, with tiled hearth and facings, and a hardwood mantel. This fireplace has paneled seats on either side. A door opens out upon porch. Dining-room is trimmed with oak, and it has a ribbed ceiling. It is separated from other apartment by double sliding doors. Kitchen and pantries are trimmed and wainscoted with whitewood and finished natural, and are furnished with the usual fixtures complete. The second floor is trimmed with ash, and it contains four bedrooms, large closets, and bathroom; the latter is wainscoted and furnished complete. Third floor contains two bedrooms and trunk room. Cemented cellar contains furnace, laundry, and other apartments. Cost $6,000 complete. G. Wood Taylor, 85 Devonshire Street, Boston, architect, and J. D. & W. H. McKnight, Springfield, Mass., builders.

Our engravings were made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.

A RESIDENCE AT CORCORAN MANOR, MOUNT VERNON, N.Y.

On page 7 we illustrate a residence recently erected for Rev. S. E. Smith, at Corcoran Manor, Mount Vernon, N. Y. The design is artistic, and has been constructed with the best materials in a first-class manner. The foundation is built of good building stone, while the underpinning is built of local bluestone laid up in broken ashlar. The exterior framework above is covered on the exterior with clapboarding, and painted yellow, with dark brown trimmings. The roof is shingled, and stained moss green. Dimensions: Front, 51 ft.; side, 41 ft., not including piazza. Height of ceilings: Cellar, 8 ft.; first story, 9 ft. 6 in.; second, 9 ft.; third, 8 ft. 6 in. The vestibule and main hall are trimmed with quartered oak. The staircase is a handsome one, and carved, the newel posts running to ceiling and supporting an archway with excellent effect. Parlor is trimmed with red birch, and it contains an ornamental fireplace, with tile trimmings and mantel to match woodwork, and of excellent design. Library and dining-room are trimmed with quartered oak, the former having an open fireplace built of brick, with hearth and facings of tiles, and mantel of oak. The conservatory is a pleasing feature of the dining-room. The floors in these apartments are provided with parquet floors of hardwood. Butler's pantry is well fitted up with drawers, shelves, sink, and dresser, provided with leaded glass dome. This pantry and kitchen are trimmed and wainscoted with ash, and the latter is provided with the usual fixtures. The second and third floors are trimmed with cypress. The second floor contains a broad, open hall and staircase, four bedrooms, dressing-room, large closets, and bathroom, the latter wainscoted with oak and provided with the best modern fixtures and exposed plumbing. Third floor contains three bedrooms and trunk room. Cemented cellar contains furnace, laundry, and other necessary apartments. Cost $7,500 complete. Mr. A. Murray Jenks, architect, Mount Vernon, N. Y.

Our engraving was made direct from a photograph of the building, taken specially for the SCIENTIFIC AMERICAN.

A DWELLING AT HASBROUCK HEIGHTS, N. J.

Our engraving on page 8 represents a perspective view and floor plans of a dwelling recently completed for Mrs. Eliza Porter, at Hasbrouck Heights, N. J. The elevations are treated in the modern style, in an attractive and pleasing manner. The underpinning is built of first quality Hackensack brick, laid in red mortar. The entire building is sheathed and papered, and covered with white pine beveled siding boards. Gables are shingled with dimension white pine shingles with cut bottoms, and all of the roofs are covered with dimension cypress shingles, and painted slate color. The dimensions are: Front, 31 ft. 6 in.; side, 40 ft. 6 in.; The heights of the ceilings are: First story, 9 ft. 6 in.; second story, 8 ft. 6 in.; attic, 8 ft.; and the cellar, 7 ft., all in the clear. The whole house throughout is finished in white pine in the natural wood. All of the doors and the windows have neatly moulded casings and mouldings. The front hall contains an ornamental staircase out of clear white ash, with newel rails and the balusters of the same, all of special designs, and is lighted with stained glass windows on the sides, and bevel plate windows on each side of the front door. A glance at the floor plans will show at once a very complete and convenient arrangement of the rooms on both first and second floors. The main rooms on the first floor are separated from each other and the hall by large sliding doors hung overhead. The parlor and dining-room contain bevel plate mirrored mantels of oak and of the latest designs, with an open grate and complete fixtures in the dining-room, of brass. The pantry and all closets on the first floor are fitted up complete with closets, drawers, cupboards, and sliding sash doors. The kitchen is also provided with, as shown, complete plumbing fixtures, as also is the bathroom on the second floor, and both are wainscoted with narrow North Carolina pine ceiling boards, with moulded cap. The floors throughout the whole building are laid with narrow North Carolina pine tongued and grooved flooring boards. There is one large room in the attic, finished with plain white pine trim and mouldings. The cellar runs under the whole house, and has a cemented bottom of concrete four inches thick, and also contains a No. 40 Thatcher tubular hot air furnace, which heats every room in the house. This house as above stated cost to build complete at Hasbrouck Heights, N. J., $3,500. Stanley A. Dennis, Arlington, N. J., architect.

Our engravings were made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.

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A COUNTRY HOUSE AT LAWRENCE PARK, BRONXVILLE, N. Y.

The engravings and floor plans, which we present on pages 9 and 10, illustrate one of the most artistic and picturesque country houses in Westchester County, N. Y, This building was erected for William O. Lawrence, Esq., at "Lawrence Park," Bronxville, N. Y. The site is rustic and unique, and the building is constructed in keeping with the surroundings. The main part of the first story and columns at piazza are built of rock-faced stone, laid up at random in a rough manner. The extension, second and third stories are built of wood. The exterior framework is covered with white pine shingles, and left to weather finish a silver gray color. The roof is shingled and finished similar. Dimensions : Front, 50 ft. ; side, 76 feet, exclusive of piazza and porte-cochère. Height of ceilings: Cellar, 8 ft.; first story, 10 ft.; second, 9 ft.; third, 8 ft. The hall, which is located in the centre of house, is most attractive. It is trimmed with oak, and it contains an ornamental staircase, with newel post extending to ceiling and supporting an archway, with space filled in with spindlework. Double sliding doors separate drawing and dining rooms from hall. Drawing-room is trimmed with maple. It is a large, well-lighted room, provided with an open fireplace built of brick, with facings and hearth laid with tiles, and a mantel made from a special design. The nook between this room and library contains an alcove for books. Library is trimmed with cherry, and is provided with a similar fireplace. Dining-room is trimmed with oak. It has a massive fireplace built of brick, with hearth and facings of same, and mantel. Butler's pantry is furnished and fitted up with the usual fixtures complete. Kitchen is trimmed and wainscoted with whitewood, finished natural, and it is provided with a large, open sink, store pantry and lobby large enough to admit ice-box. The second floor is trimmed with whitewood, part of which is stained and the remainder treated in colors. This floor contains five bedrooms, nine closets, bath, servants' bedrooms and trunk room, while the third floor contains two bedrooms and ample storage. Bathroom is fitted up replete. Cemented cellar contains furnace, laundry, and other apartments. Cost $10,000. Mr. William A. Bates, architect, No. 149 Broadway, New York.

Our engravings were made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.

PUBLIC SCHOOL NO. 9, ERIE, PA.

We present on page 11 a photo of Public School No. 9, recently erected at Erie, Pa. The design combines a striking exterior appearance and a convenient interior arrangement. It is built of brick, laid up in red mortar. The underpinning and trimmings are of granite, with the faces left rough as they came from the quarry. The roof is covered with slates. The large entrance halls, the steps inside of vestibule, and broad stairways make the school very convenient. The interior throughout is trimmed with hardwood, and the walls are wainscoted to a height of three feet. There are eight school rooms, 30 x 30, providing accommodation for five hundred children. The rooms are well lighted, and the building is provided with all the modern heating, ventilating, and sanitary appliances. The cloak rooms are fitted up with stationary racks and ample wardrobe hooks for clothing. At one end of hall on second floor the principal's office is provided. The basement contains the toilet rooms and heating apparatus. Cost $38,000 complete. Mr. Joseph Frank, architect, Erie, Pa.

Our engraving was made direct from a photograph of the building, taken specially for the SCIENTIFIC AMERICAN.

A HALF-TIMBERED COTTAGE OF MODERATE COST.

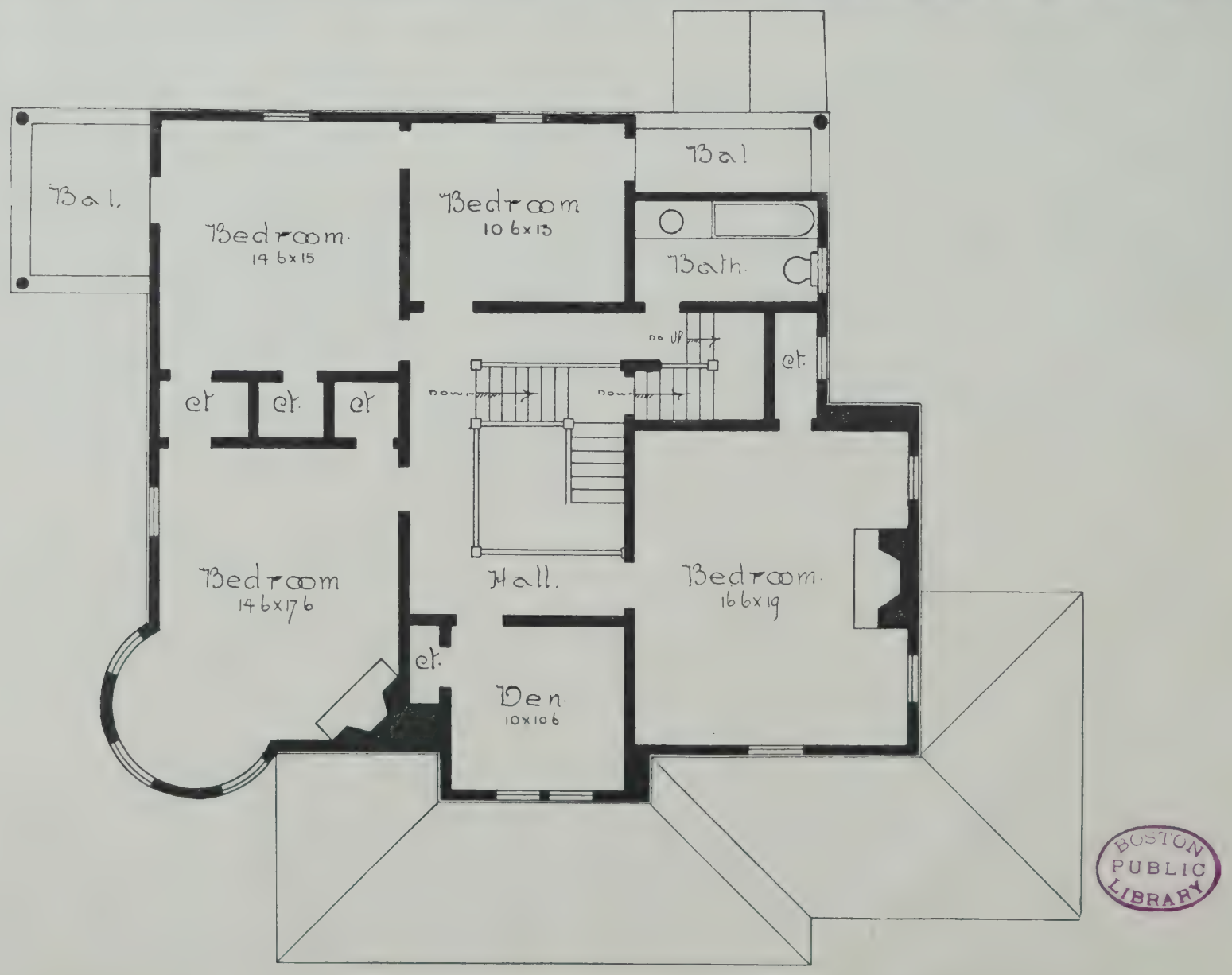
We illustrate on page 12 a half-timbered cottage of moderate cost, at Glen Ridge, N. J., the residence of B. R. Jacobs, Esq. The view shows a pleasing exterior, underpinning and first story being of rubble field stone, 16 inches in thickness, laid with black mortar joints. This is relieved by quoins of red brick at angles and reveals. Projecting square bay is supported by corbeled brick brackets. Second story is of hard plaster on usual framework, smooth finish, timbering given slight projection, and stained green. Roof of green slate. Chimneys of brick, capped with stone. There is a broad, well shaded veranda, with square posts supporting hipped roof above. Trimming color, dark green; sash and blinds, olive. Dimensions: Front, 32 ft.; side, 37 ft. 6 in., not including veranda projection. Heights: Cellar, 7 ft.; first story, 9 ft.; second, 8 ft. 6 in.; attic, 8 ft. The first floor plan shows a reception hall of good size, having double flat arch at staircase, with column for newel, and turned balusters. Angle fireplace of brick, with shelf above; plaster tinted light terra-cotta; trim, cream. Flat arch (soffit paneled) to parlor, having similar fireplace. Seat in square bay, with mullioned window. Plaster, sand float finish, tinted light yellow, with pale pink frieze and ceiling. Low arched opening to dining-room, with brick fireplace, paneled above. China closets, with leaded glass doors on each side. Broad, mullioned windows, square bay, and high paneled oak wainscoting. Exposed beams in ceiling. Plaster is sand finish, tinted dark terra-cotta. Floors of hardwood in principal rooms. Butler's pantry, having sink and china closets, connects with kitchen, with usual fixtures, store closet, and back stairs. Second floor divided into four chambers with closets, and bathroom complete, with usual fixtures of good make. Attic has three chambers finished off, and store room, and is lighted by dormer windows. Cellar, cemented, contains laundry, with two tubs, hot air furnace and fuel bins. E. R. Tilton, Esq., architect, 24 State street, New York City, from whom any further information may be obtained.

Our engraving was made direct from a photograph of the building, taken specially for the SCIENTIFIC AMERICAN, with the consent of the owner, W. T. Taliaferro, Esq.

A COLONIAL RESIDENCE AT SPRINGFIELD, MASS.—See page 2.

A Great Bell.

On October 30, the casting of the great bell for the tower of St. Francis de Sales Church, Cincinnati, began, and the flow of metal continued for about two hours before the work was completed. It is the largest bell in the United States, and fifteen tons of bell metal was used in the casting. In addition to this, the clapper, weighs 640 pounds. The main dimensions of the bell are: Diameter of the ring, 9 feet; diameter of crown, 5 feet. It is 7 feet high. Swung in the tower, the bell is to cost $10,000. For illustrations of the mode of casting such bells, see SCIENTIFIC AMERICAN of September 7, 1895.



Second Floor.

A RESIDENCE AT ORANGE, N. J.—See page 2.

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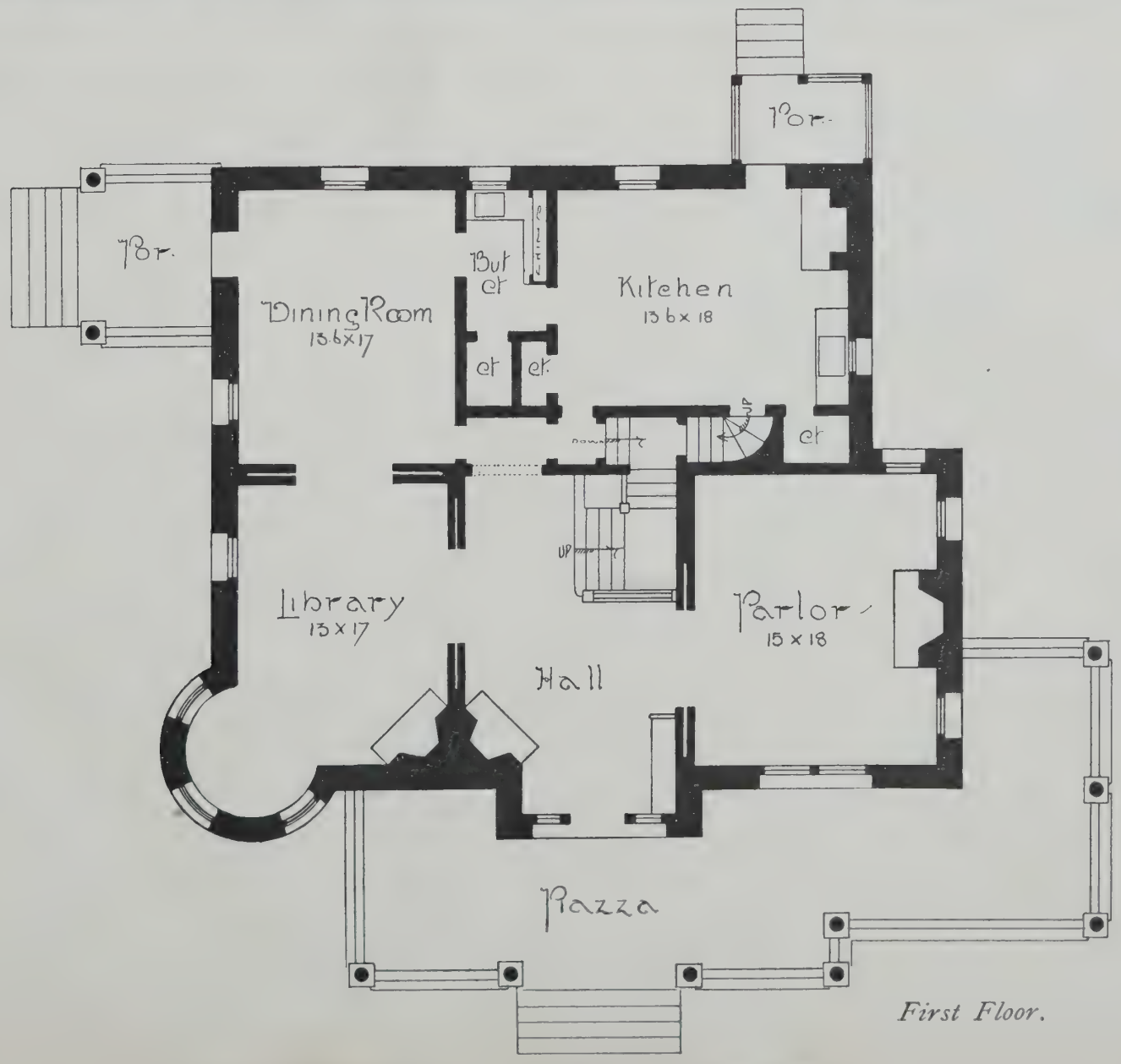

First Floor.

A RESIDENCE AT ORANGE, N. J.—See page 2.

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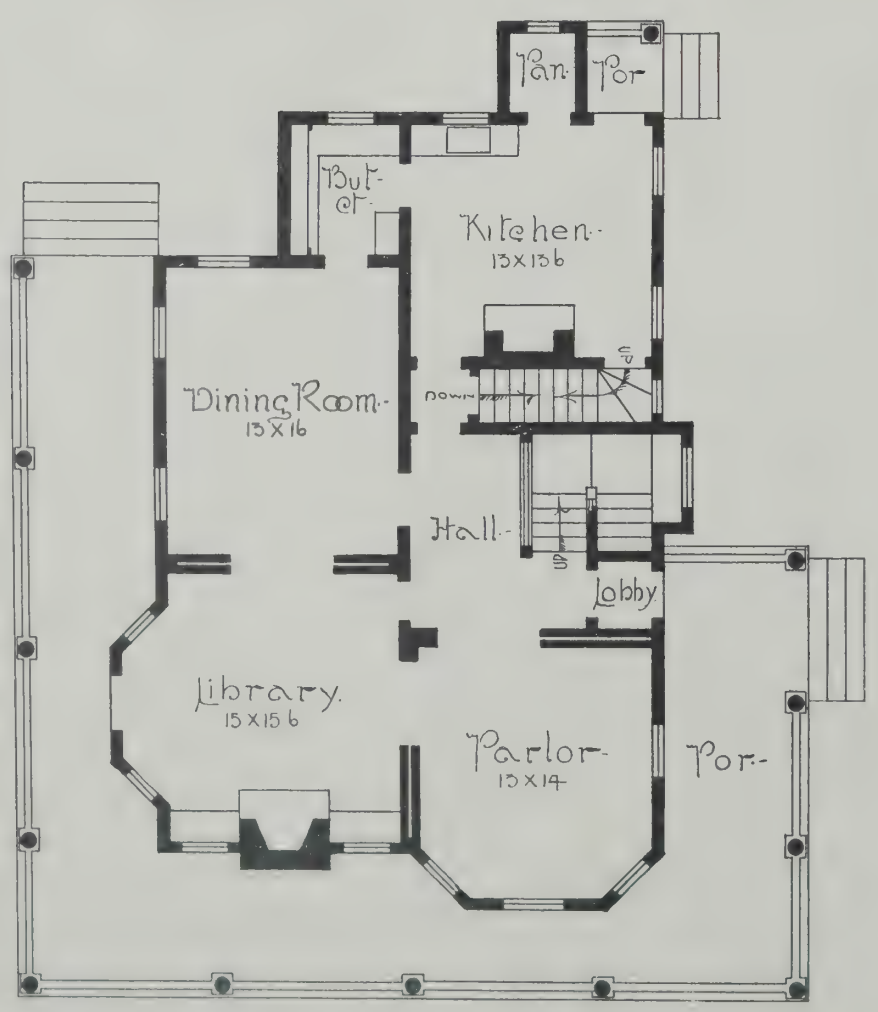

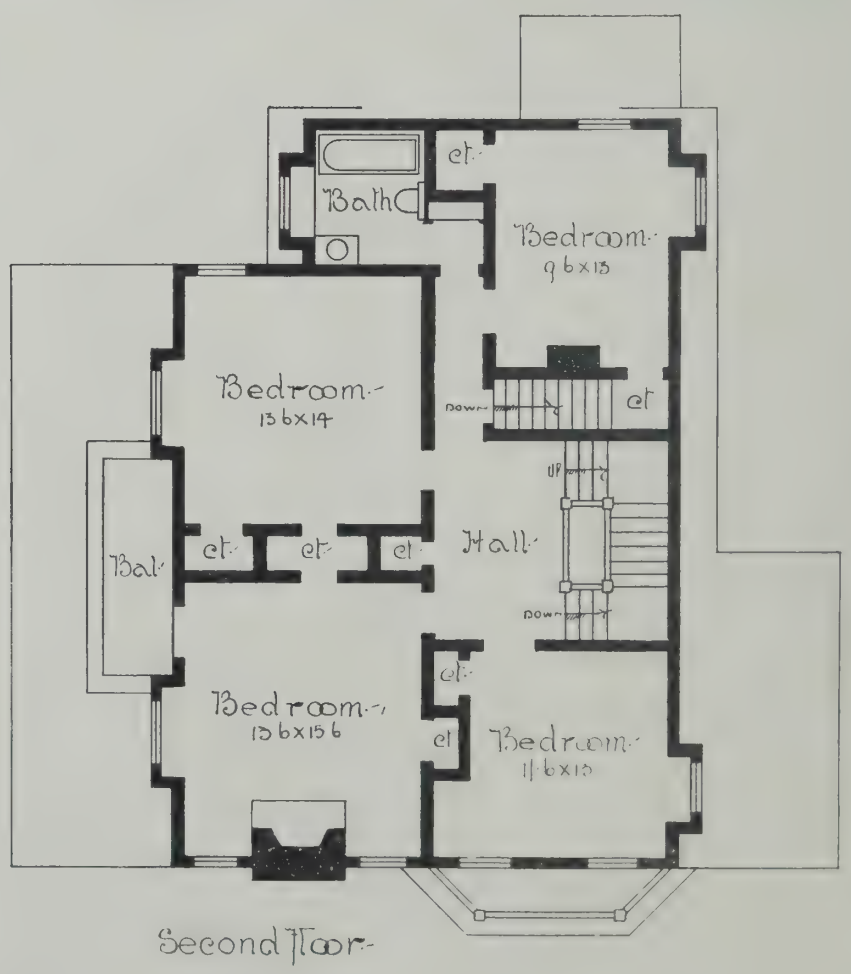

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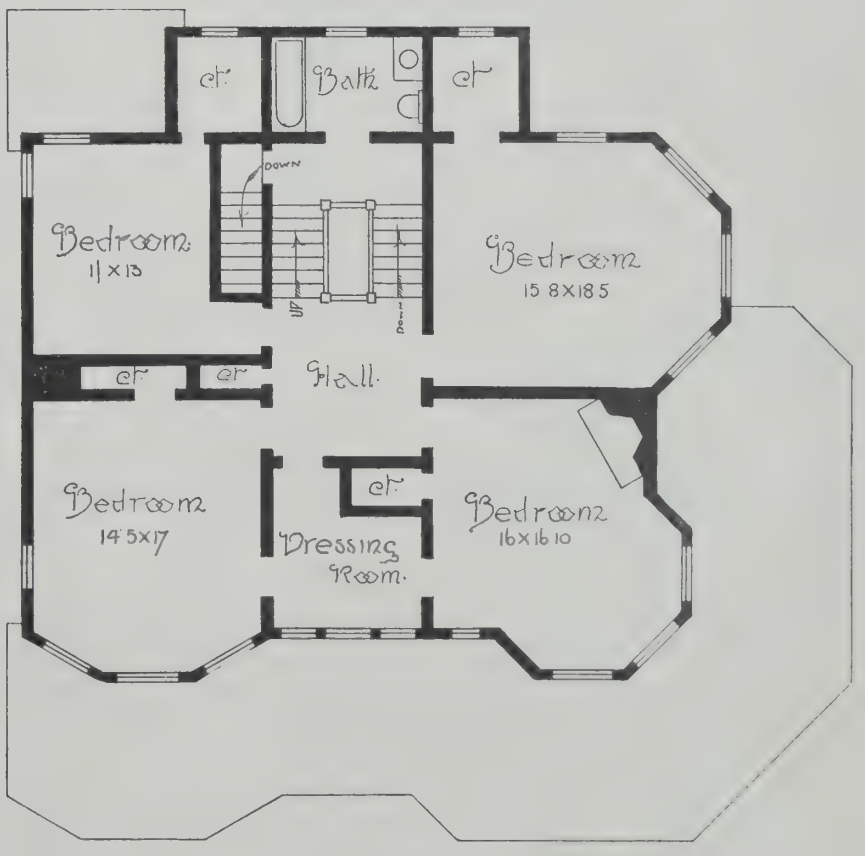
A COLONIAL RESIDENCE AT SPRINGFIELD, MASS.—See page 2.

First Floor.



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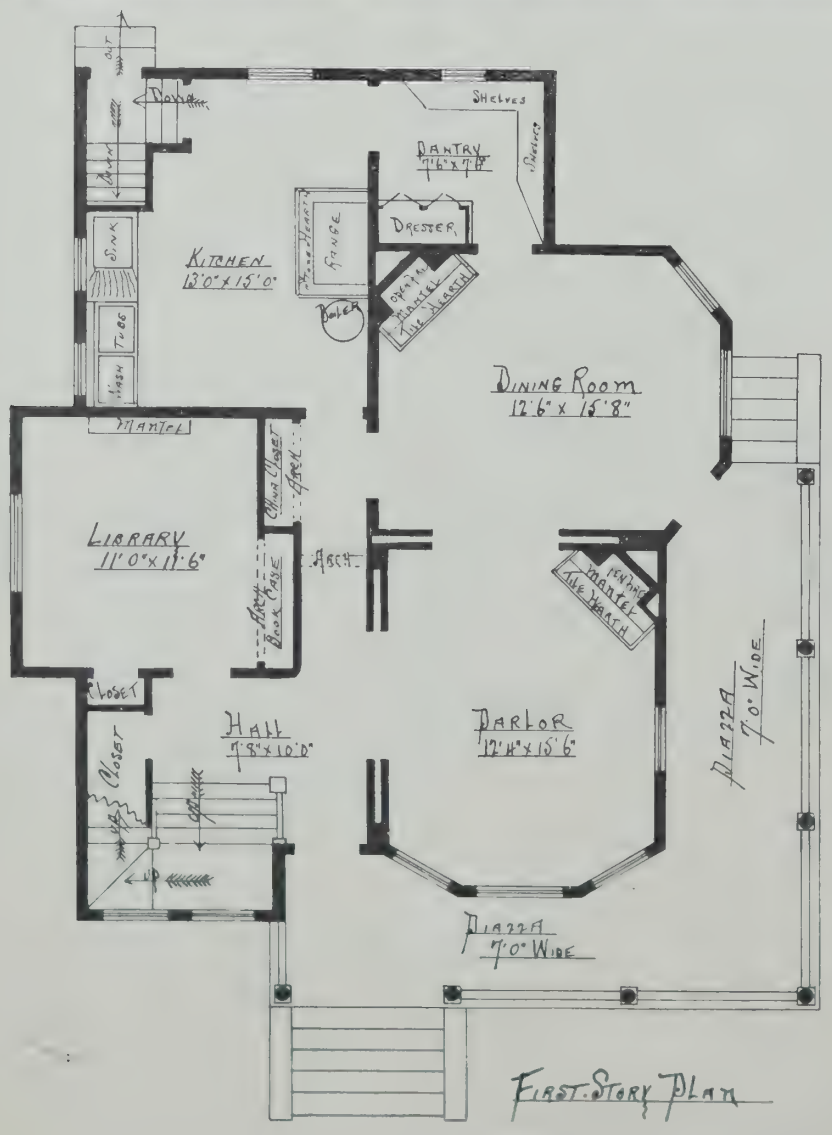
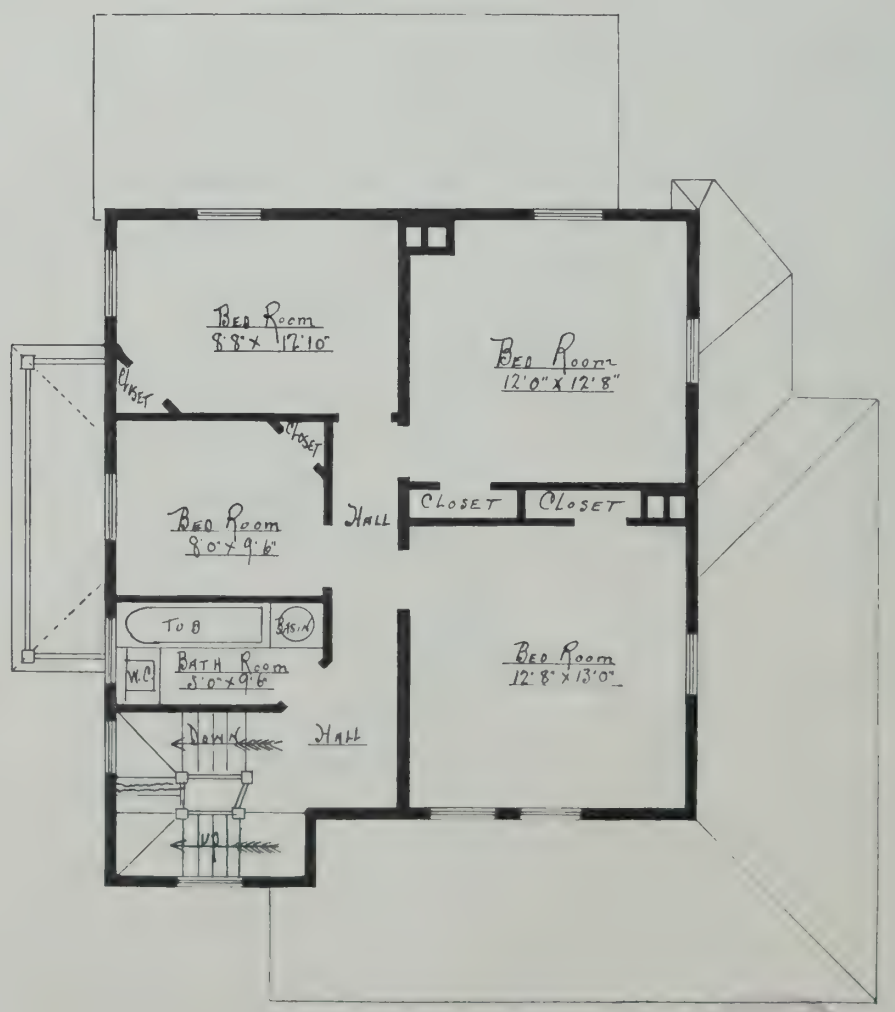
A RESIDENCE AT MOUNT VERNON, N. Y.—See page 2.

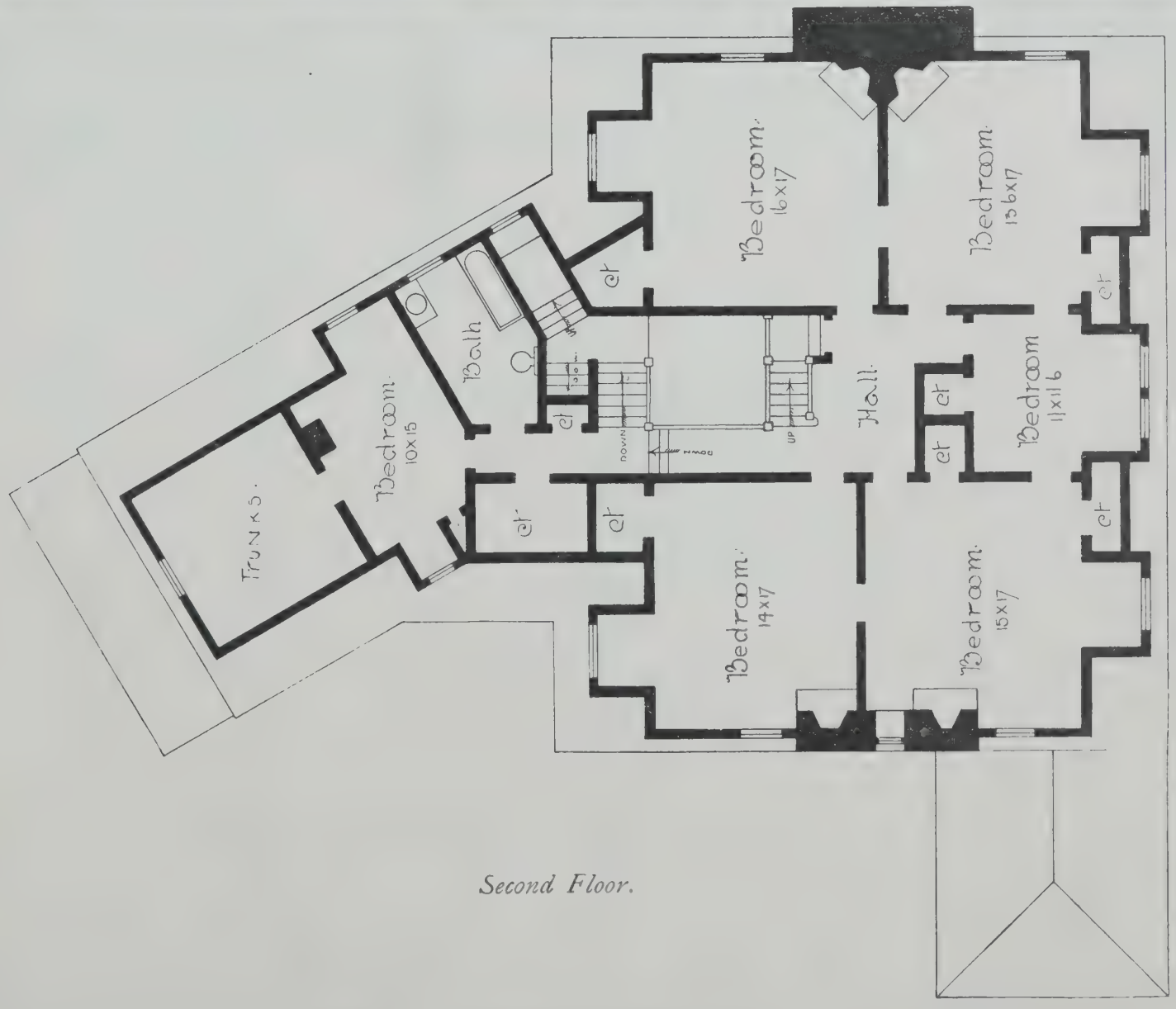


First Story Plan



Second Story Plan

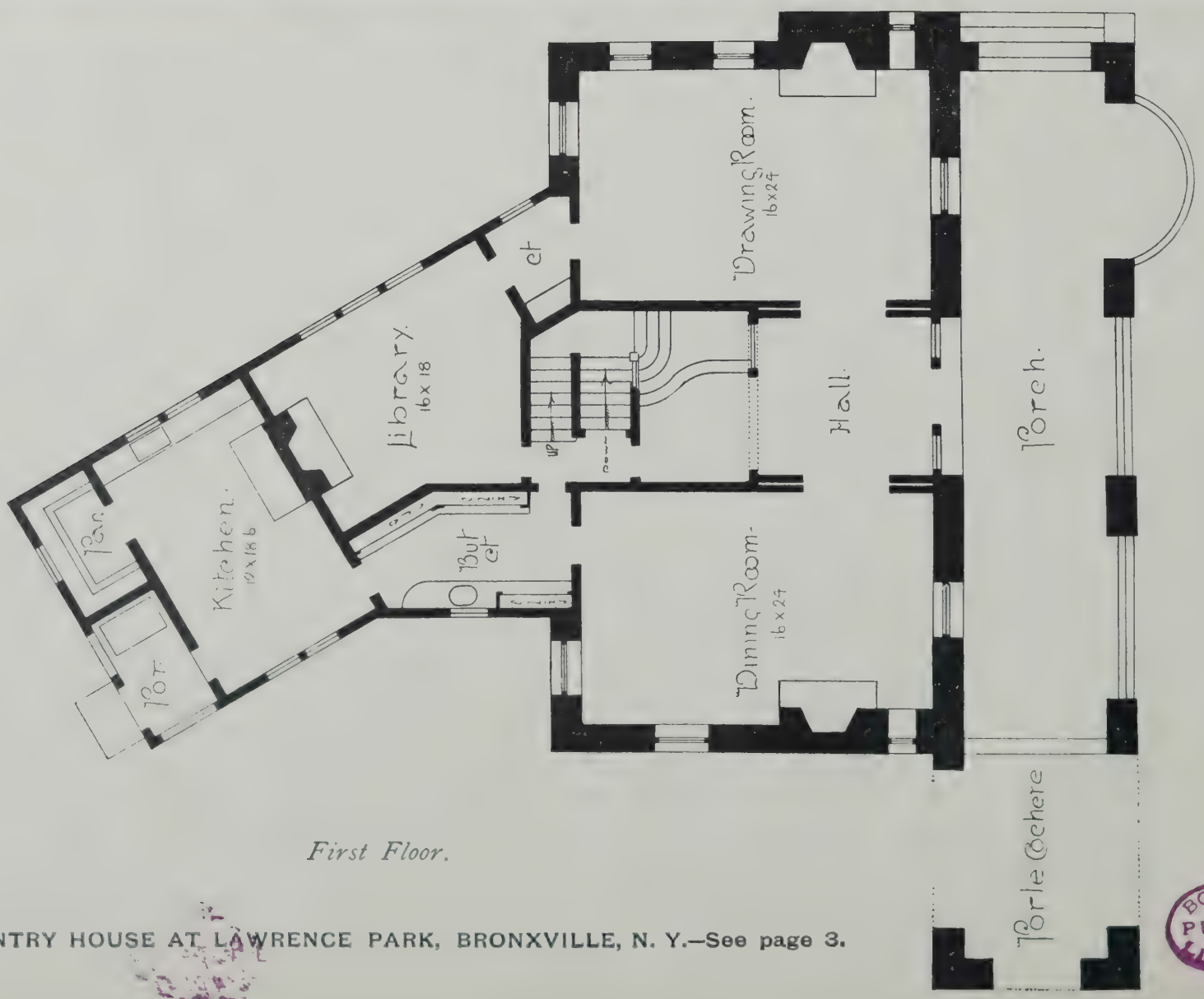
A DWELLING AT HASBROUCK HEIGHTS, N. J.—See page 2.



Second Floor.

LIBRARY

A COUNTRY HOUSE AT LAWRENCE PARK, BRONXVILLE, N. Y.—See page 3.



First Floor.

A COUNTRY HOUSE AT LAWRENCE PARK, BRONXVILLE, N. Y.—See page 3.

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PUBLIC SCHOOL No. 9, ERIE, PA.—See page 3.

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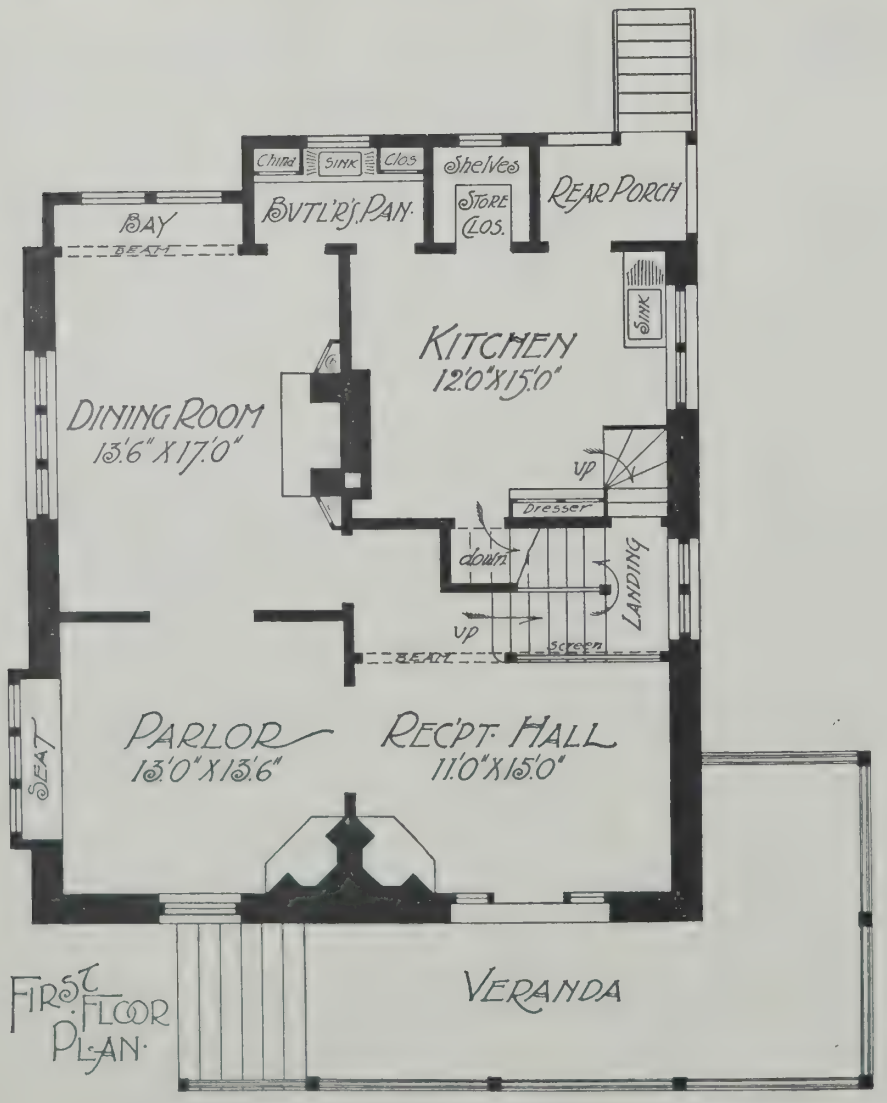
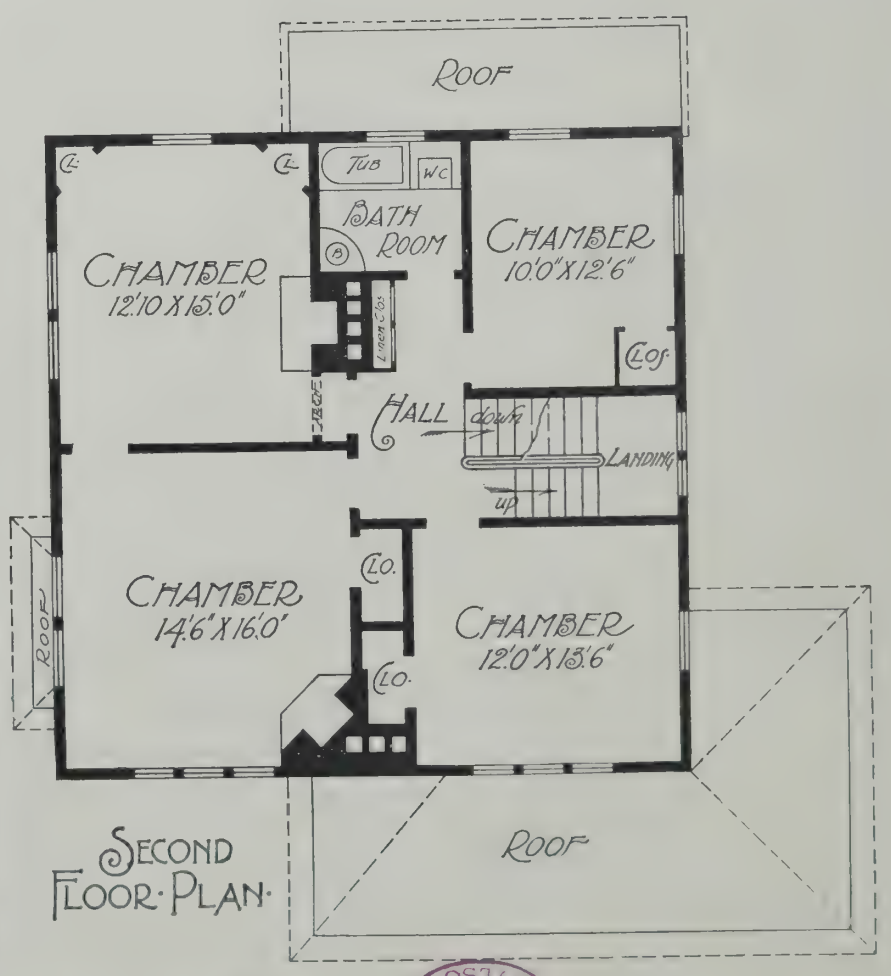




A HALF-TIMBERED COTTAGE.—See page 3.

BOSTON PUBLIC LIBRARY

THE WASHINGTON ARCH, NEW YORK CITY.

This beautiful work of art was erected by private subscription as a memorial of the one hundredth anniversary of the first Presidential inauguration of Washington, which took place in this city April 30, 1789. The arch stands in Washington Square, and faces the entrance to the beautiful street known as Fifth Avenue. The work was designed by Mr. Stanford White, who is a member of the architectural firm of McKim, Mead & White. The arch is built of white marble from the quarries of Tuckahoe, near New York. The dimensions are as follows: Height, 73 ft. 6 in.; width, 56 ft. 10 in.; width of opening, 30 ft.; height of opening, 47 ft. 9 in. It consists of a single arch, says Mr. Stanford White, supporting an entablature and attic, and springing from plain piers, broken on the north side only by pedestals, designed for the reception of groups of statuary. Above the impost, which is ornamented with a Greek fret, are decorated panels, those on the north side containing in the centre shields bearing the coat of-arms, crests, and mottoes of General Washington and of the United States, and those on the south the arm of the State and the city of New York. The arms of Washington are described as "Argent, two bars gules, in chief three mullets." A raven over a coronet constitutes the crest, and the motto reads, "Exitus acta probat." The space around these shields is filled with trophies, treated in a purely decorative manner, there being above—on the north side (which is the more elaborate)—a wreath of oak encircling a sword hilt, and flanked with festoons, clustered banners, and insignia of war; below, another wreath of laurel, echoing that above, and affixed to crossed cannon of the old type. On the south side are again trophies of a different design, consisting of flags, spears, swords, and bows and arrows, grouped above and below the central shields bearing the coats-of-arms. The spandrels between these panels and the carved arch mouldings are designed to receive allegorical figures. A large and highly decorated keystone marks the culmination of the arch, and binds it to the architrave of the main entablature, and this, with the spirited eagle surmounting it and unfolding its wings over the main frieze to the extent of almost eleven feet, may be considered the centre of the "motif." The frieze itself, of which the eagle on either façade forms the central figure, is of unusual depth, and is very elaborately adorned with wreaths of laurel in high relief, containing twelve large stars, which, with that on the keystone of the south front, represent the original thirteen States. Between the wreaths and the lower relief are sprays of oak and laurel crossed, and infolding the initial letter W. The smaller stars represent the number of States at the time of erection. The frieze and the bold and severely ornamented cornice above it dominate the rest of the construction, including even the attic above, which, though massive and bearing the chief inscriptions, is kept comparatively in subordination to the main entablature. The inscription incised in Roman letters, reads on the north façade, "To commemorate the One Hundredth Anniversary of the Inauguration of George Washington as First President of the United States," and on the south, "'Let us raise a Standard to which the Wise and the Honest can repair. The Event is in the Hands of God.'—Washington." Another inscription on the architrave below sets forth that the arch was "Erected by the People of the City of New York." On the eastern and western panels of the attic are the dates 1789 and 1889, in Roman letters. The great vault, which rises to the height of over forty-seven feet above the roadway, is ornamented with coffers and rosettes in the usual Roman manner.

THE WASHINGTON ARCH, NEW YORK CITY.

Calvert Vaux.

In the death of Calvert Vaux, who was accidentally drowned near this city, November 20, the profession of landscape art in this country has suffered an almost irreparable loss. Born in London almost seventy-one years ago, he had already achieved distinction in his profession as an architect, when at the age of twenty-four he accepted an invitation from Andrew J. Downing to come to this country as his business associate. He had a talent for landscape painting and an appreciative love of scenery, which enabled him to combine effectually natural objects and artificial structures. For several years the two artists were successful colaborers in the field of landscape art, and at the time of Downing's untimely death in 1854, they were engaged in designing and constructing the grounds about the Capitol and the Smithsonian Institution, in Washington, the most important work of the kind which has yet been attempted in this country. Meanwhile, the gathering sentiment in favor of spacious and accessible city parks which had found expression in the eloquent letters of Downing, at last secured, through legislative action, the purchase for a public pleasure ground, of the rectangular piece of land now known as Central Park. In 1858 the city authorities selected, out of thirty-three designs offered in competition for the new park, the one signed "Greensward," which was the joint work of Frederick Law Olmsted and Calvert Vaux, and Central Park as we know it to-day is the realization of this design in its essential features. This was the earliest example in this country of a public park conceived and treated as a consistent work of landscape art, and the first attempt in any country to plan a spacious pleasure ground which should have the charm of simple, natural scenery, while it met the requirements of complete inclosure by a compactly built city. No one can read the original plan as presented for competition without feeling how thoroughly an experience of nearly forty years has justified the forethought of the young artists, or without a sense of gratitude to them that our first great park, which has to such an extent furnished a stimulus and a standard to other American cities for similar undertakings for all time to come, was a work of such simplicity, dignity, refinement and strength. It may be added that this "Greensward" plan, together with other reports on Central Park, on Morningside and Riverside Parks, of this city, on parks in Brooklyn, Albany, Chicago, San Francisco, and other cities, both in this country and the Dominion of Canada, by the same authors, contains a consistent body of doctrine relating to public pleasure grounds, a systematic theory of park art, with illustrative examples, which is unique and invaluable. Mr. Vaux had been a member of many important commissions, and he acted as landscape adviser for the Niagara Falls Reservation, but for more than thirty years his best work and thought had been steadily given to this city, where, as landscape architect of the Department of Parks, he had designed many minor parks and squares as they have been acquired, and had completed the details of the larger ones. He had the genuine creative faculty which gave the stamp of originality to all his work, and a severity of taste which preserved it from anything like eccentricity or extravagance; and while thus fully equipped on the artistic side, he had a fertility of resource and an unflagging industry which enabled him to grapple successfully with all the complicated practical problems of his profession.

In private life Mr. Vaux was a man of singular modesty, gentleness, and sincerity, and while his learning and accomplishments gave him an assured position in the republic of letters and of art, his kindly and unselfish disposition endeared him to every one with whom he was closely associated. As a city official he was a model of intelligent zeal and sturdy integrity, and no man in public life was evermore loyal to his duty or to his art. More than once, when some construction affecting the design of the parks was undertaken against his advice, he promptly resigned, but in every instance he was quickly reinstated in obedience to a vigorous demand of the people of the city, who felt assured that while his counsel prevailed their pleasure grounds were safe. To Calvert Vaux, more than to any other one man, this city owes a debt of gratitude for the fact that Central Park, in spite of attacks on every side, has been held so secure against harmful invasion, and has been developed so strictly on the lines of its original artistic conception.

The World's Tallest Structures.

The tallest chimney was built at Port Dundas, Glasgow, Scotland, 1857 to 1859, for F. Townsend. It is the highest chimney in the world (454 feet), and one of the loftiest masonry structures in existence. It is, independent of its size, one of the best specimens of substantial, well made brickwork in existence. In Europe there are only two church steeples that exceed this structure in height—namely, that of the Cologne Cathedral (510 feet) and that of the Strassburg Cathedral (468 feet). The great Pyramid of Gizeh was originally 480 feet, although not so high at present. The United States outtops them all with its Washington Monument, 550 feet high, and the tower of the Philadelphia Public Buildings, which is 537 feet high.

The Eiffel Tower, at Paris, France, surpasses all other terrestrial metal structures with its altitude of nearly one thousand feet. The "Great Tower," for London, England, in course of construction from designs of Mr. Henry Davey, C.E., will outtop all metal structures, being built of steel, and its extreme height will be 1,250 feet when finished.

The highest and most remarkable metal chimney in the world is erected at the imperial foundry at Halsbrucke near Freiberg, in Saxony. The height of this structure is 452.6 feet and 15.74 feet in internal diameter, and is situated on the right bank of the Mulde, at an elevation of 219 feet above that of the foundry works, so that its total height above the sea is no less than 711.75 feet. The works are situated on the left bank of the river, and the furnace gases are conveyed across the river to the chimney on a bridge through a pipe 3,227½ feet in length.

The highest office building in the world is the Manhattan Life Insurance Co., of New York City.—*Machinery.*

THE AMERICAN SURETY BUILDING.

This imposing edifice, which stands on the corner of Pine Street and Broadway, is rapidly nearing completion, and it will be ready for occupation some time before the close of the year. With a total height from curbstone to coping of 314 feet, it can claim to be the loftiest inhabited building in the world. The Masonic building in Chicago is also over one hundred yards in height, if we reckon the roof stories; but the Surety building presents a finer architectural effect, owing to the fact that its front rises in a perpendicular line from the sidewalk to the massive top coping, above which there are no inharmonious roof lines projecting, to spoil the general symmetry of its appearance. The base line measures 84 feet 8 inches on Broadway, and 85 feet 6 inches on Pine Street, making a proportion of base to height of about 1 to 4. Strictly speaking, the Surety building is a colossal tower.

It is a skeleton frame structure; the outer walls being of brick, faced with dressed gray granite. The architectural treatment of the exterior is carried out on a bold and massive scale, the cornices being deep and heavy; and the bald, blank effect, which one would naturally expect in walls of this height, is altogether wanting. This is in a large measure due, we think, to the depth of the windows, resulting from the great thickness of the walls, which ranges from four feet in the lower one hundred feet of the building to two feet six inches at the top. Although covering an area only 85 feet square, the building contains over 400 rooms. They open into a central landing, through which pass the six elevators and a spiral stairway.

The roof is flat, and affords a promenade that is certainly unique. Leaning against the great granite blocks that form the coping, one can enjoy at leisure a panorama of rare interest and beauty; and it is certainly a novel sensation to look down upon the cross of Trinity steeple and the towers of Brooklyn Bridge.

By the courtesy of Mr. Bruce Price, the architect, we are enabled to present the chief details of the fireproof construction, as carried out in this building.

The interior columns are all protected with a thickness of 3½ inches of fire-brick "furring" and by the marble finish. The flooring is carried on 15 inch I beams, between which a flooring of 10 inch fireproof blocks is built. The blocks that are placed next the I beams have a thick flange that projects down and under the base of the beam, the two flanges meeting at the center of the base and completely covering it in. Below this is the ceiling plaster. Above the fireproof blocks are laid the 4 inch joists that carry the flooring, and the space between these is filled in with a special filling known as "ash concrete." This construction provides a solid floor of incombustible, non-conducting material that is 17 inches in thickness.

Throughout the whole building there is not a square inch of the steel framework that is exposed to the action of fire.

In regard to the risk of fire from the adjacent buildings, it was thought best to assume that the Schermerhorn building, though it is constructed as a first-class fireproof structure, might be the victim of a conflagration. Accordingly the walls on the south and east sides, which are adjacent to the Schermerhorn, are built up solid and 4 feet in thickness to a height of over 100 feet, the latter building being 110 feet high. This provides a protection of 2 feet of walling on the outside of the main columns—an amount that would give ample protection against the hottest fire.

The first line of windows above the adjacent building is furnished with iron shutters. It would have been better if the next ten stories had been so fitted. It is just here, if anywhere, that this fine building is vulnerable. The fire from the south side of Bleecker Street swept in through the windows of the Manhattan building, across the street. Iron shutters are unsightly, but they may prove the salvation of the building that carries them. The next best protection would be the furnishing of each window with asbestos curtains, such as are used between stage and auditorium in the theaters.

The Surety building carries 50,000 gallons of water for fire purposes stored in two large tanks; one on the twenty-first and one on the tenth story. Each floor is provided with 2½ inch portable hose.

There is one feature of the construction that is interesting, as showing how in these days the architect and the engineer are merging into one. The great bending strains that are set up in the framework of the building by the wind pressure necessitate the introduction of a system of lateral bracing. Every other story is stiffened in this way with diagonal ties and braces, which form a complete lateral truss across the width of the building in each direction.

THE NEW SURETY BUILDING, NEW YORK.

Powerful Dredge for the Mississippi River.

The Mississippi River Commission are the owners of the largest dredge in the world. The hull is 40 feet in beam by 140 feet in length. There are six diggers, which operate at the mouth of the intake of the suction pumps, and serve to loosen and break up the bed of the river sufficiently for the solid matter, sand, mud, gravel and so forth, to be drawn up and carried off by the discharge pipes. The pumping engines are of 1,200 horse power. The pumping capacity is 6,000,000 gallons of water an hour; and it is estimated that the dredge can handle twenty-seven cubic yards of sand in one minute. A good idea of its capacity for work can be gained from the statement of the New York Herald that "if it were possible to float it in New York's main thoroughfare, the Broadway tunnel could be dug at the rate of a mile and a half a month."

The Centenary of the Institute of France.

The centennial of the Institute of France was celebrated with great eclat. On the first day, November 23, a religious service was held in St. Germain des Près in memory of all members of the Institute deceased since its foundation, by Monseigneur Perraud, Bishop of Autun, a member of the Académie Française, and a very distinguished writer and philosopher.

On the next day (Thursday, 24th) a general meeting was held in the large hemicycle of the new Sorbonne, so splendily decorated by the paintings of Puvis de Chavannes. The President of the French Republic was present with such ministers as were not professionally detained at the Chambre des Députés.

In the morning a short reception took place at the Elysée, where the President of the republic received the foreign members of the Institute. The foreign associates and correspondents to the number of fifty-five were presented to President Faure by the office bearers of their respective academies. The President welcomed them and held a short conversation with each.

In the evening a banquet took place at the Hotel Continental. Two hundred and fifty members were present. After two short "after-dinner" speeches by M. Ambroise Thomas and M. Poincaré, M. Max Muller, acting as spokesman for all the foreign members and associates, proposed the health of the Institute, "which, alone, remains unaltered and immovable in its renown and glory, while so many things have changed during this century," in very excellent terms. Most happily inspired was Lord Kelvin in his address. The very cordial and sympathetic expression which the Royal Society gave to its feelings in its address to the Institute was received with much satisfaction, and the few words which closed the orator's speech went to the heart of all Frenchmen: "Personally, I cannot express how much I appreciate the great honor you have done me in electing me among the associates of the Institute. But I owe to France an even greater debt. She has been, truly, the alma mater of my scientific youth, and has inspired my admiration for the beauty of science, which during my whole life has kept me chained in her service. It was Laplace who initiated me into celestial mechanics, and a few years later the venerable Biot led me by the hand and introduced me to Regnault's laboratory. To Regnault and Liouville I shall eternally be grateful for their kindness toward me, and for the solid teaching they gave me, in 1849, on experimental physics and mathematics. M. President of the Institute, gentlemen, I thank you with all my heart. From what I have said, you will understand why I consider with perfect gratefulness France as the alma mater of my scientific life." Great applause followed his speech.

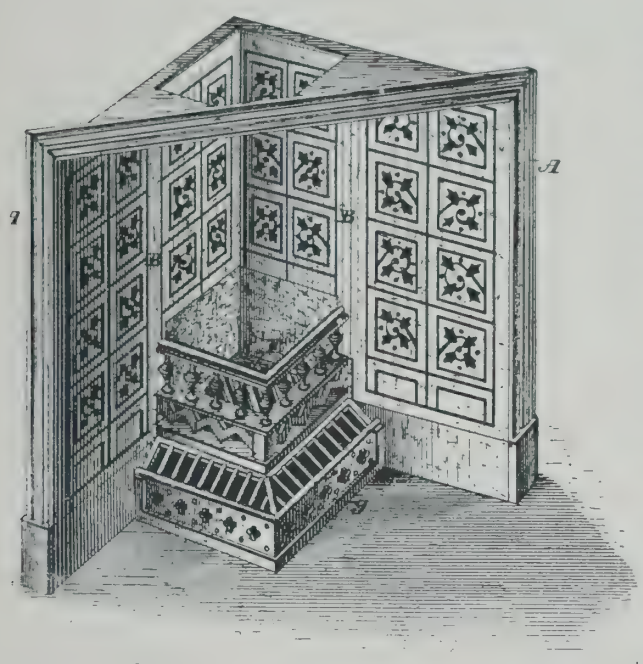
The 25th was devoted to an afternoon in the Théâtre Français; in the evening a reception was held at the Elysée by the President. The last day was a visit to the magnificent residence of Chantilly, to the Duc d'Aumale, by special train, carrying 239 members, and at Chantilly eleven large vehicles transported the whole assembly to the chateau, through part of the woods, the race course, and the stables. The duke, who had hardly recovered from an attack of gout, had to receive his guests sitting in a rolling chair, and received them most cordially. The afternoon was devoted to inspection of the residence itself, which has been splendidly enlarged and embellished by the present proprietor, and to the surrounding grounds. The whole of Chantilly and of its contents has been bequeathed by the duke to the Institute. This represents nearly $10,000,000.

A NEW CORNER GRATE.

Nothing marks greater economy of floor area than the corner fireplace, as the space in the angle of a room usually is of no value. But the corner fireplace has some serious disadvantages, especially in fitting a square grate to a triangle of brickwork, and then in twisting the flue around to run parallel with the walls.

The "corner grate," patented by Edwin A. Jackson, of New York, overcomes all these difficulties, and effects an enormous gain in heating results. Figure 1 shows the general appearance of the grate, when open; Figure 2, when closed; while Figure 3 shows the plan. As will be

Fig. 1



seen by these, a square grate is placed with its sides parallel to the walls, which, because it is in the corner of the room, means with one angle projecting. Handsome backings line each side of the fireplace, while a hinge at B B permits the front flange, F F, to fold over, so that the grate can be completely inclosed, as in Fig. 2. In this case, the fire is practically in a straight flue from floor to roof, resulting in a strong draught and a quick kindling of the fire. This overcomes all tendency to smoke. When open, the full effect of the fire can be seen in every part of the room, and every ray of heat striking the back is reflected out, instead of, as in the old form, lost in the back or up the chimney. The crown piece, G G, hides the ashes, they dropping into a pan, or can be arranged to fit the ashpit below. A frame of brass or iron, A A, finishes the front of the grate, and around this can be set tiles or mantel, as with other open fires.

The gain in heat, and the fine effect from all parts of the room, make this fireplace unique in its economic heat and beautiful appearance. Catalogue F will be forwarded by Edwin A. Jackson & Bro., 50 Beekman Street, New York.

Fig. 2.

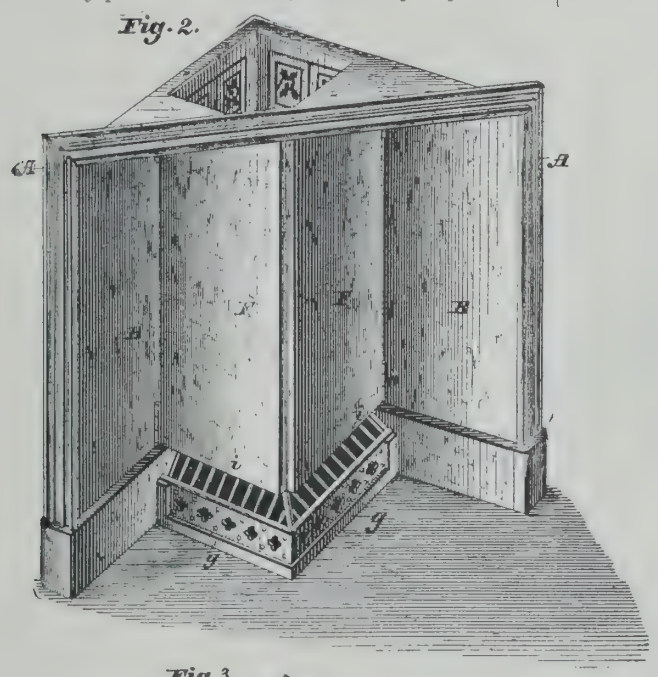
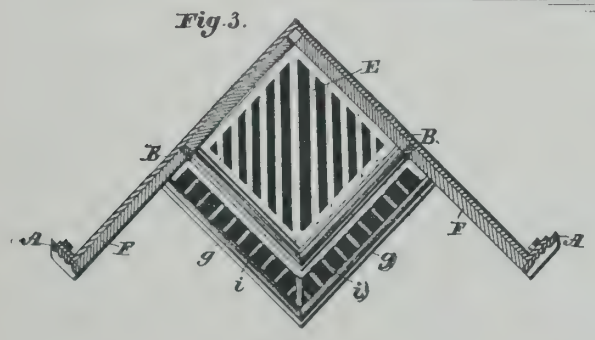


Fig. 3.



THE NEW JACKSON CORNER GRATE.

The "American Trackless" Sliding Door Hanger.

Important improvements in sliding door hangers have been introduced by the Van Wagoner & Williams Hardware Company, of Cleveland, Ohio. In substituting an adjustable and removable frame for the rigid one formerly used they have brought forward a feature of great utility. Besides the saving of time and material by avoiding overhead framing, no openings to circulate draughts or accumulate dust are left over the door. The hanger being trackless and wheelless, it cannot sag or bind, and as it is fastened direct to studding it offers the most rigid resistance, and is least liable to settle or get out of line. An illustration of these hangers appears in the advertisement of the company, on page iii. It can be taken out, replaced, or adjusted, without disturbing the plastering or disarranging the room, and can be adjusted to a hair. They have been thoroughly tested, and are indorsed by many leading architects. The hangers run smoothly and easily, and are warranted to give satisfaction. The Van Wagoner & Williams Hardware Company will be pleased to send working directions, or to give information where working model can be seen, upon request.

THE self-lifting elevator is one in which the person using it lifts himself, but without appreciable exertion. It is manufactured by the Self-Lifting Elevator Company, of Lima, Ohio, for use in residences, mills, stores, etc. The passenger elevator is for use of but one person at a time. The car, counterbalance, cables and ropes are very similar to those of other elevators, but the weight adjustments and cable attachments adapt it for convenient use by persons of different weights, the person using the elevator rolling the proper weight into position by a sweep of the hand. A slight pull on the hand cord then takes the passenger up or down, as desired. While it is intended to operate the elevator by the hand cord, it is also provided with a brake, controlled by foot pressure. This brake is of new design, recently patented. It is attached to the floor of car, and is always under the control of the person using the elevator, thus preventing the car from falling should a cable break, and also preventing its running away. The brake is always locked, except when released by foot pressure, and the mere lifting of the foot will stop the car absolutely. *For residences,* the size generally used is 30 x 32 inches, ornamental wire car, gold bronze, or painted any color desired. *For flour mills, factories and warehouses,* the size generally used is 30 x 30 or 30 x 32, open car, yellow pine, hard oil finish.

THE St. Joseph Pump & Manufacturing Company, of St. Joseph, Mo., whose former plant was destroyed by fire several months ago, are again in position to do business on a larger scale than before, having secured a new site, on which is a stone building, 50 x 150 ft., on Grand Avenue, near Ninth Street. Additional adjoining buildings are also nearing completion. The pumps of this company have had a most enviable reputation, and it is not surprising that orders for several carloads of them have accumulated during the brief enforced suspension of their business.

THE Nason Manufacturing Company, of 71 Beekman Street, New York City, in their recently issued catalogue, present a marvelously extended list of steam engineering specialties, and machinists', gasfitters' and plumbers' tools and supplies, together with the Nason patented specialties in steam and hot water heating. The book has 366 pages, and most of the articles are represented by pictures as well as concise description, the price lists giving rates for different sizes and styles of finish. The pages giving general and practical information on steam and hot water heating are especially valuable. The business was established by Joseph Nason in 1841, and has had a continuous healthy growth ever since.

MESSRS. F. WEBER & CO., of 1125 Chestnut Street, Philadelphia, Penn., have just issued an illustrated catalogue devoted entirely to architects' and engineers' supplies. It is one of the most complete in this line of business, is handsomely illustrated, and the articles described are arranged in a consecutive form and numbered for the convenience of their patrons.

The firm draws special attention to their celebrated Reifler Instruments, which are novel in construction, durable and superior in quality, and combine all the improvements in drawing instrument making to date.

THE HANDCO "STRAIGHT FLUSH" CLOSET.

The syphon jet closet, one of the most improved sanitary fixtures yet brought out, has been made a special feature of the business of Hoy & Co., No. 21 Green Street, Albany, N. Y., for some time past. The accompanying illustration represents this extremely neat and efficient appliance, on which these manufacturers have, in order

THE HANDCO "STRAIGHT FLUSH" CLOSET.

to induce specially large sales, reduced the price to about one-half of that usually charged for similar goods. Their efforts have met with wide appreciation, and the Handco is now rapidly replacing the unsanitary washout and hopper. The nickel pipes are away from the wall, and are thus more easily cleaned, and the straight down flush pipe doubles the force of the water entering the closet.

DIXON'S Silica Graphite Paint, manufactured by the Joseph Dixon Crucible Co., of Jersey City, N. J., will be used in painting all the tin work and skylights of the Post Office Department building, at Washington. A quantity will also be used on the Capitol and the District government building.

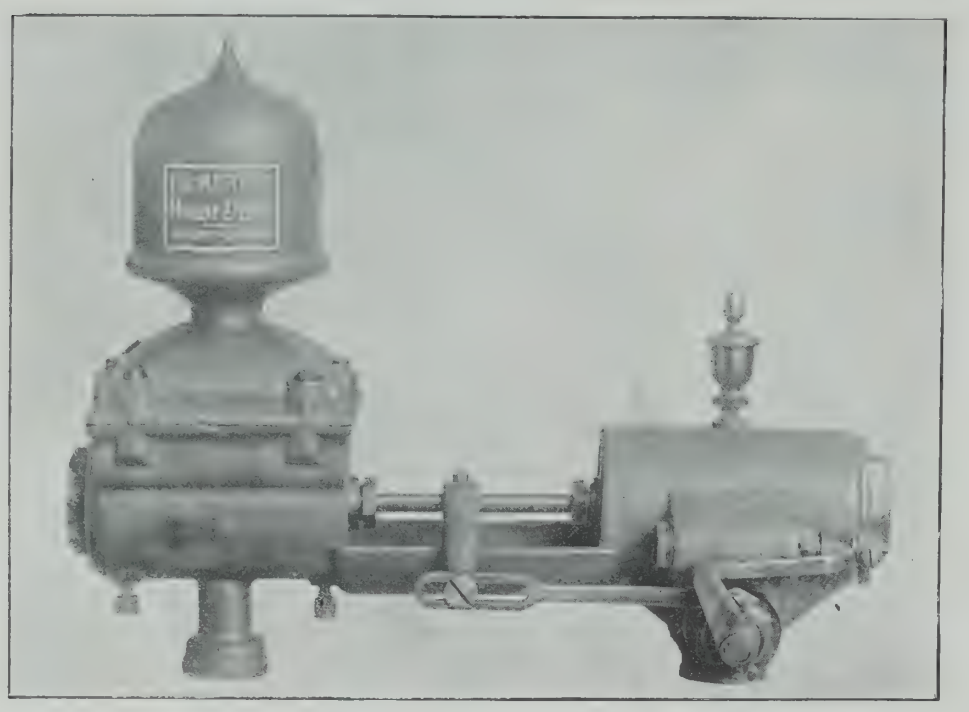
THE Chambers McKee Glass Co. have lately made Vanhorne, Griffen & Co., of 52–56 Varick Street, New York, sole agents for the sale of their product of American Window Glass, for the Middle and Eastern States.

THE Powhatan Clay Manufacturing Company, of Richmond, Va., has canceled all of its agencies, and in the future all sales will be negotiated from the home office, at Richmond. The sales department of the company will be under the management of Mr. F. H. S. Morrison, formerly of Lippincott & Morrison, of Baltimore, Md. The company will hereafter manufacture cream white brick only, which is made necessary by the great popularity of and steadily increasing demand for these brick in the markets of New York and elsewhere.

THE Hartman inside sliding window blinds can be readily attached to the ordinary window frame, and readily removed therefrom, the blind sliding up and down like the sash, and being held in any desired place by steel springs, which are concealed from view. They are made in three or more parts or sections in height, each moving independently of the other, and in two, three, four, or more panels in width. They are made by the Hartman Sliding Blind Company, of Crestline, Ohio.

A SIMPLE AND EFFICIENT PUMP.

The pump shown in the illustration has been especially designed for pumping soft water to attic tanks, for use in the bath and laundry, etc. It consists of two parts, each perfect in itself, and may be used for pumping in all places where there is a hydraulic pressure of over ten pounds. It is manufactured by Martin Schneble's Sons, manufacturers of twine and rope machinery, automatic engines, shafting, hangers, etc., Dayton, Ohio. The motor is made in sizes having relatively different proportions of motor and pump cylinders, according to the initial pressure of the supply or the height to which water is to be forced. The pump is of such simple construction that



THE PICKERING MOTOR PUMP.

it may be taken apart by any one, and put together again, without liability of misplacing or losing settings of the different parts. Every pump is tested before leaving the works.

Staining Wood Black.

A process that is much employed for the above purpose consists in painting the wood consecutively with copper sulphate solution (1 per cent.) and alcoholic aniline acetate (equal parts of alcohol and acetate). A very durable black—and the nearest approach to real ebony—is readily obtained by moistening the surface of the wood with dilute sulphuric acid (1 : 20), and subsequently applying heat. A temperature of 60°—90° C. suffices in a very few minutes to procure the desired result. An excellent black was obtained in this way on beech, bass, and box wood; while a second treatment with acid was necessary in the case of cherry, walnut, and birch. With oak and ash the results were not so good; and apple and different varieties of pine were still less amenable to the process, pine especially being unevenly stained. In order to afterward remove the acid from the wood, it might be well to thoroughly wash the latter with dilute soda solution, followed by clean water. It is unlikely that this method can be applied to any but small articles, because of the risk of possible fractures during the necessary heating of the wood.—*Badische Gewerbe-Zeitung.*

When water freezes, it expands with a force which Trautwine estimates at not less than 30,000 lb. to the square inch.

Artificial Fuel.

Anthracite briquettes have heretofore failed as fuel because the material has never been used in a sufficiently finely divided state. According to this invention, anthracite small coal ("duff") is passed through a disintegrator, which will deliver it in such a condition that it will all pass through a sieve of at least twenty wires per linear inch, a finer condition being preferable. It is then mixed with, say, 6 per cent. of equally finely powdered pitch, and the mixture is passed on to a pug-mill, wherein, say, 6 per cent. of coal tar or other liquid hydrocarbon is incorporated with the mass. The mixture prepared in this way is heated by superheated steam, and compressed into briquette moulds at a pressure of about two tons per square inch. If it be desired to render the briquettes smokeless, they may be gradually heated to about 800° or 900° C. It is claimed for these briquettes that each cakes separately in the furnace, that they are not deteriorated by rain, and that they are hard enough to bear tipping from a wagon or from sacks.—W. H. Biggs and R. R. Greenhow, Glamorgan.

Ancient Glass Makers.

The glass blowers of ancient Thebes are known to have been as proficient in that particular art as the most scientific craftsman of the same trade of the present day, after a lapse of forty centuries of so-called "progress." They were well acquainted with the art of staining glass, and are known to have produced that commodity in great profusion and perfection. Rossellini gives an illustration of a piece of stained glass known to be four thousand years old, which displayed artistic taste of high order, both in tint and design. In this case the color is struck through the vitrified structure, and he mentions designs struck entirely in pieces from one-half inch to three-quarters inch thick, the color being perfectly incorporated with the structure of the piece, and exactly the same on both the obverse and the reverse sides. The priests of Ptah at Memphis were adepts in the glass maker's art, and not only did they have factories for manufacturing the common crystal variety, but they had learned the vitrifying of the different colors, and the imitating of precious stones to perfection. Their imitations of the amethyst and other colored gems were so true to nature that even now, after they have lain in the desert sands 2,000 to 4,000 years, it takes an expert to distinguish the genuine articles from the spurious. It has been shown that they used the diamond in cutting and engraving glass. In the British Museum there is a beautiful piece of stained glass, with an engraved emblazonment of the monarch Thothmes III., who lived 3,400 years ago.

The National Saw Company are sending out from their general office at Newark, N. J., a very attractive and serviceable calendar, 8 x 11 inches, for the year 1896. Copies, we understand, may be secured by our readers upon application. The National Saw Company operate Wheeler, Madden & Clemson Mfg. Co., Woodrough & McParlin, Richardson Bros., and Harvey W. Peace Co., and the superiority of their product is known and acknowledged the world over.

House Numbering.

Berlin is preparing to fête the hundredth birthday of the house number. In the London and Paris of a century ago ciphered houses did not exist. The coat of arms, the house name, and the signboard were the only indications to guide our ancestors' wandering feet by day or dark. "Watchman, what of the night, and where the deuce am I?" must often have been the cry of these bewildered minds. Berlin began to number houses in 1795. Starting from the Brandenburg gate, the Prussian ediles counted straight on to infinity, neither beginning afresh with fresh streets nor numbering the houses by odds and evens. Vienna adopted the latter reform in 1803, and Paris followed in 1805.

Fires in "Sky Scrapers."

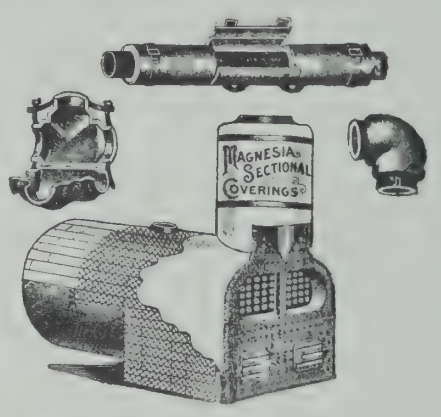
At a recent fire the Chicago firemen demonstrated at the Masonic Temple their ability to cope with fires in the upper stories of the tallest buildings. Engine No. 1 of the city fire department pumped a stream of water through 500 feet of hose and standpipes to the roof of the building, where there was sufficient force to drench the roofs of neighboring buildings. The water pressure at the engine was 240 pounds. On the roof at the same time the pressure was 54 pounds to the inch.

The length of the standpipe from the ground to the roof of the Masonic Temple is 323 feet. The sight of an engine and firemen at this sky scraper attracted a crowd of people, who were well soaked for their curiosity.

The result of the test was gratifying to Chief Swenie of the Fire Department and to the insurance men present.

NON-HEAT-CONDUCTING COVERINGS.

The accompanying cut shows a style of coverings approved by architectural and engineering experts, namely, the Magnesia Sectional Coverings. They are made in sections three feet long for steam and water pipes; in blocks for boilers and flue pipes, and in plaster for fireproofing or filling in. These coverings are of a high grade, and durable, and are being used in many of the new buildings and residences now being erected. The increased comfort resulting from the covering of the



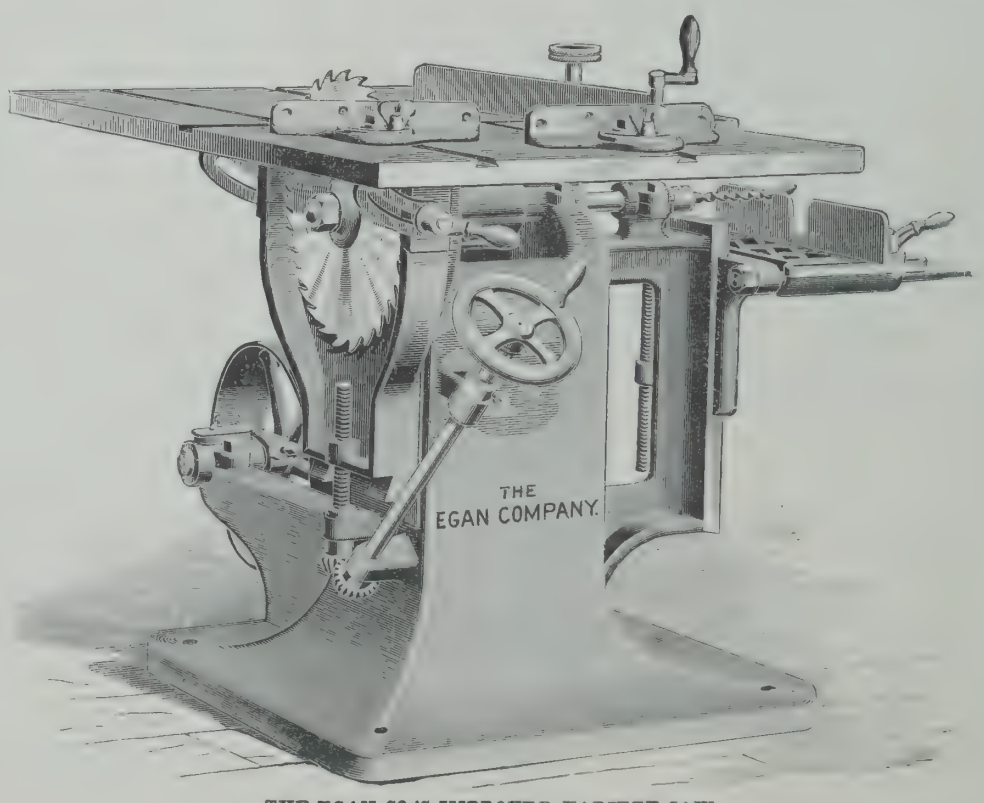
MAGNESIA SECTIONAL COVERINGS.

hot air pipes in one's cellar is apparent, first, in keeping a cool cellar, and, second, in increased heat and ventilation in the rooms.

For further particulars, address the manufacturer, Robert A. Keasbey, 54 Warren Street, New York.

IMPROVED WOODWORKING MACHINERY

The machine shown in the illustration has many advantages and conveniences in the way of ripping, crosscutting, grooving, and has the tilting table, and in addition has a boring attachment, making a very convenient and desirable machine for general work in almost any kind of a woodworking factory. The column is cast hollow, in one solid piece, with ample floor space, and extension arms for the support of the counter shaft are a part of the main frame, and extend sufficiently to give ample length of belt to drive the mandrel. The table is of iron, planed and grooved perfectly true, and made to work



THE EGAN CO.'S IMPROVED VARIETY SAW.

straight or on a bevel, also to adjust up and down, and fitted with two mitre guides and one ripping fence. The boring attachment is connected to the column, and has table to raise and lower independent of the main table, so that two men can work at the machine at the same time, without one interfering in any way with the other. The saw mandrel is of the best quality of cast steel, running in three bearings lined with best genuine Babbitt metal, with pulley running between the two boxes, under the table. One end of the mandrel is bored out to receive the chuck or boring bit, and the other end arranged to carry a saw or grooving head. The machine is manufactured by the Egan Company, 209 to 229 West Front Street, Cincinnati, Ohio, U. S. A.

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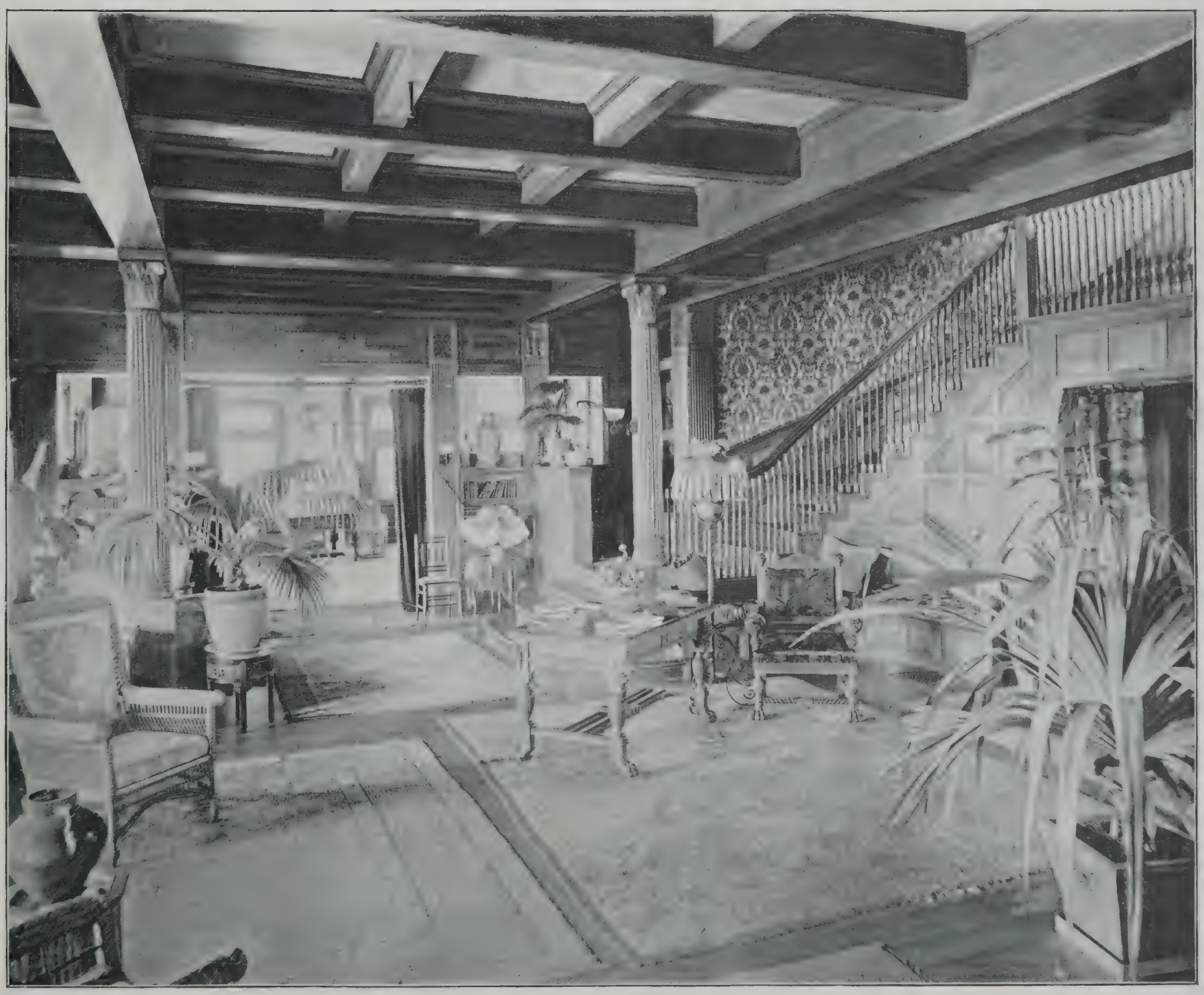

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MAIN HALL AND LIBRARY OF A RESIDENCE AT GREEN'S FARMS, CONN.—See page 18.

Scientific American.

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NEW YORK, FEBRUARY, 1896

THE

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SCIENTIFIC AMERICAN, BUILDING EDITION.

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BEGINNING A NEW DECADE.

It will probably be a matter of surprise to those who have been constant readers of the ARCHITECT AND BUILDER since the days of its first inception, that the tenth birthday of this journal has quietly come and gone. It is almost a matter of surprise to ourselves. It is not our purpose now to comment upon the almost instantaneous success that the paper attained with its very first issues, showing that there was a demand on the part of the public for a publication of this character. In beginning a new decade, it shall be the object of the editors, not alone to keep up the standard of the past, but to improve it, if possible, and perhaps to introduce a greater variety of architectural work. The main object of this publication is to furnish plans and elevations of country residences of somewhat moderate cost; but there has been a noticeable demand amongst our readers for houses of more importance, and also city residences. It often happens that those who contemplate building, although they perhaps intend to limit their monetary outlay to a modest expenditure, are able to get ideas and suggestions from mansions of considerable importance, which may be adapted to their own uses, and which their architect may be able to introduce without any material increase of expenditure. Such a course is often followed, and leads to very pleasing and satisfactory results. The houses illustrated in these pages are selected without prejudice or partiality, and it will relieve us from much unnecessary correspondence if our readers who desire further information than that contained in these pages will correspond directly with the architects, to whom credit is always given for all work illustrated.

A RESIDENCE AT HOLYOKE, MASS.

We publish on page 24 a residence recently erected for O. B. Allen, Esq., at Holyoke, Mass. The perspective views present a most striking example of American architecture. It is well proportioned, is built in a thorough substantial manner of the best materials, and has many excellent bits of detail. There are many bay windows, well shaded and spacious piazza, porte-cochère, balcony and lookout at third floor. The underpinning is built of brick laid up in red mortar. The building above is sheathed, papered, and the first story is clapboarded, while the second and third stories are shingled. The whole building is painted white, blinds green, roof red. Dimensions: Front, 40 ft.; side, 57 ft., not including piazza. Height of ceilings: Cellar, 8 ft.; first story, 10 ft.; second, 9 ft.; third, 8 ft. 6 in. The interior arrangement is excellent. The entrance is at side, through vestibule, into a broad, spacious hall, surrounded by its various apartments. A vista of the entire suite is obtained immediately upon entering. The hall is trimmed with quartered oak. It has a paneled wainscoting and a ribbed ceiling. The fireplaces, and other fireplaces, are built of brick, with facings and hearths of tiles, and carved mantels to correspond with trim of the various apartments respectively. The staircase is an ornamental one, with carved newel post, turned out of similar wood. This staircase and hall are lighted by a bay window and a stained glass window at first landing. Reception room is treated with ivory white in a delicate manner. Library is trimmed with sycamore, and dining-room with oak. The latter has a paneled wainscoting, and a buffet built in and carved. Den is trimmed with oak, and it has an outside entrance thereto. The butler's pantry is trimmed with brick, and is fitted up with shelves inclosed with glass doors, cupboards and dresser. Kitchen, pantries, rear hall and lobby are trimmed and wainscoted with yellow pine, finished natural. These apartments are fitted up with the usual fixtures complete. The second floor is trimmed with sycamore, and it contains four bedrooms, den, large closets, and two bathrooms. Den is fitted up in a unique manner with a paneled divan. The bathrooms are wainscoted and furnished with exposed plumbing complete. Three bedrooms and trunk room on third floor, and storage in attic if desired. Cemented cellar contains furnace, laundry and other apartments. Mr. G. P. B. Alderman, architect, Holyoke, Mass.

Our engravings were made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.

A STABLE AT HOLYOKE, MASS.

We publish on page 25 a stable, accompanying a residence shown on page 24, which has been recently erected for O. B. Allen, Esq., at Holyoke, Mass. The design is good, and the plans are excellent. There is a stove cellar under part of building, with stone foundations and an underpinning built of local brick, laid up in red mortar. The building is sheathed and then covered with shingles. It is painted white. The roof is also shingled, and painted red. The building is 40 x 55 ft., exclusive of shed. The driveway is a convenience, with stable on one side, harness-room at the end, and carriage-room opposite stable. The driveway is provided with a carriage wash. Carriage room is well lighted, and is separated by sliding doors. Stable is well lighted and ventilated, and it contains four stalls and one box-stall, provided with the usual ornamental iron fixtures. Harness-room is furnished with a closet and sliding glass doors. Work-room, of good size, is fitted up with chimney. The second floor contains man's room, hay-loft, and storage. The interior is trimmed with yellow pine, finished with hard oil. The walls and ceilings are sealed up with narrow beaded stuff. Mr. G. P. B. Alderman, architect, Holyoke, Mass.

Our engravings were made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.

A RESIDENCE AT GREEN'S FARMS, CONN.

We publish on pages 17, 20, 21, engravings and floor plans of a residence recently erected for Charles Sooysmith, Esq., at Green's Farms, Conn. The building is situated on a very prominent site, overlooking Long Island Sound, and it presents a substantial appearance, and is built of the best materials, in a thorough workmanlike manner. The main lines are well broken by many bay windows, porte-cochère, and a spacious piazza, well shaded. The first story at front, chimneys, and columns to piazza are built of local rock-faced bowlders, laid up at random in red mortar, while the second story above is built of Pompeian brick. The remainder of the two stories is covered on the exterior with shingles, and left to weather finish. The roof is shingled and finished similar. Dimensions: Front, 106 ft.; side, 47 ft., not including piazza. Height of ceilings: Cellar, 8 ft. 6 in; first story, 11 ft.; second, 9 ft. 6 in.; third, 8 ft. 6 in. The entrance is through a very large vestibule, with walls and ceiling paneled in oak. The study, at the right of vestibule, is trimmed with oak, and is provided with an open fireplace. The main hall, spacious, is trimmed with oak. The walls are paneled, and the ceiling is heavily beamed; the main beams are supported on Corinthian columns, with flutings and carved caps. The winding staircase has spindle balusters, and pleasant nooks with seats. There are also several bookcases built in at random, and an open fireplace built of brick, with hearth and facings of same, wrought iron trimmings, and a mantel of oak, and elegantly carved. The library is separated by square fluted pillars from hall, and it is trimmed with butternut. It has a paneled wainscoting, ceiling beams, bookcases, nook, and fireplace with a carved mantel. The music room is treated with China white in an elegant manner. This room is a marvel of beauty; the furniture and piano are carried out in the same scheme of coloring. It has a nook with paneled seats, and an open fireplace with Mexican onyx facings and a dainty mantel with columns. Dining-room is trimmed with mahogany, and it has a ribbed ceiling, conservatory, and fireplace. The floors throughout are laid with oak in narrow widths, and highly polished. The butler's pantry, rear stairway, and lavatory are conveniently located, and each is provided and fitted up in the best possible manner with the usual fixtures. The second floor contains seven bedrooms, nfteen closets, three bathrooms and nursery. These apartments are treated in a delicate manner with colors. The bathrooms are wainscoted and paved with white English tiles, and are provided with porcelain fixtures with nickelplated exposed plumbing. The third floor contains two bedrooms and billiard room. Cellar, cemented, contains laundry, kitchen, and pantries, besides the furnace and storage rooms. Cost $58,000 complete. Mr. W. W. Kent, architect, 1262 Broadway, New York City, N. Y.

The "Gardener's Gate Lodge" is a picturesque, low building, with a slanting roof, and is one story in height. The front wall is built of rock-faced stone laid up at random, and the remaining walls are shingled on the exterior, and left to weather finish. Roof shingled, and finished in the same manner. The plan shows a large living room, provided with dressers, sink, and other conveniences, and a bedroom with closet. The woodwork throughout is yellow pine, treated and finished in hard oil. There is a cellar under building, with an outside entrance thereto. The building was erected under the supervision of the architect who designed the other buildings on this interesting place.

Our engravings were made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.

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BRANCH OFFICE: 622 F Street, Washington, D. C.

A RESIDENCE AT CHESTER HILL, MOUNT VERNON, N. Y.

We illustrate on pages 19 and 28 in this issue a residence recently erected for Lyman G. Willson, Esq., at Chester Hill, Mount Vernon, N. Y. The perspective presents a good, substantial design, with the lines well broken by several bay windows, piazza, and porch. The underpinning is built of red brick, laid up in red mortar. The first story is covered with clapboards, and the second and third stories with shingles. It is painted Colonial yellow, with white trimmings. The roof is slated. Dimensions: Front, 44 ft.; side, 41 ft., not including front piazza and porch. Height of ceilings: Cellar, 7 ft.; first story, 10 ft.; second, 9 ft.; third, 8 ft. Cemented cellar contains laundry, furnace, and other apartments. The vestibule is paneled with oak, and is paved with tiles. Hall is trimmed with oak, and it has a paneled wainscoting and an ornamental staircase turned out of oak, with carved newel posts. The doorways opening into the various apartments are cabinet trimmed, and are provided with spindle transoms. The parlor contains a false fireplace, with a tiled hearth and facings, and a carved mantel with mirror. This room is trimmed with hazel. Library is trimmed with birch, and it has a paneled divan in bay window. Dining-room is trimmed with oak, and it has a ribbed ceiling and a paneled wainscoting. It has also a buffet built in and elegantly carved, and provided with a mosaic glass window over same. The nook in hall has a similar window and also seats. The fireplaces where shown are built of brick, with tiled hearths and facings, and mantels carved and made to correspond to the trim of each apartment. The floors are laid with oak, and highly polished. The windows throughout are glazed with French plate glass. Kitchen and pantries are trimmed and wainscoted with yellow pine, finished natural. These apartments are fitted up with the best modern conveniences. The lobby is large enough to admit ice box. The second and third floors are trimmed with cypress and finished natural; the former contains four bedrooms, alcove, closet and bath, and the latter contains four bedrooms and trunk room. The bathroom is wainscoted and furnished with the usual fixtures, with exposed plumbing. Cost $9,000 complete. Mr. Lyman G. Willson, architect, Mount Vernon, N. Y.

Our engravings were made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.

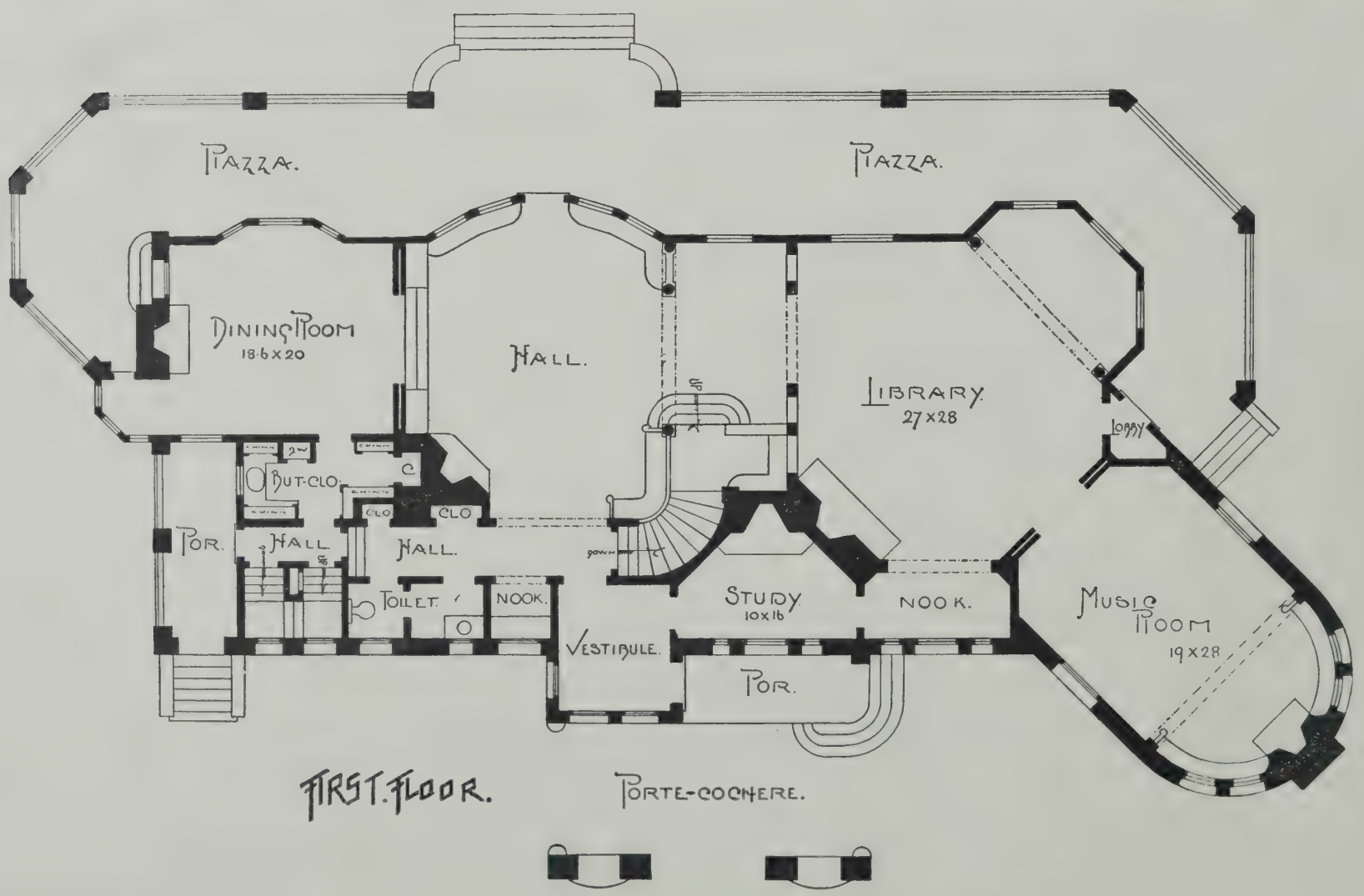
A RESIDENCE AT ORANGE, N. J.

On pages 22 and 23 will be found perspective views of the exterior and interior and floor plans of a house erected for C. S. Trench, Esq., at Highland Avenue, Orange, N. J. The building has a pleasing exterior and a well-arranged plan, and is adapted to a site with a large frontage. The entire first story is built of Belleville stone, gray and brown, laid in courses alternately. Above this point the building is covered with cypress shingles, and left to finish natural. The roof, however, is stained dark gray, and the trimmings are painted bottle green. Dimensions: Front, 67 ft.; side, 49 ft., not including piazza. Height of ceilings: Cellar, 8 ft.; first story, 10 ft.; second, 9 ft.; third, 8 ft. 6 in. The first story embraces a large reception hall, parlor, library, den, dining-room, kitchen, pantries, and lavatory. The spacious veranda at the rear commands a fine view of the Orange Mountains, and the conservatory off the parlor and library is an attractive feature. Both the first and second stories are trimmed with quartered oak. The entrance way is provided with a broad "Dutch" door, with windows on either side. The hall has a beamed ceiling and a paneled wainscoting. The Dutch fireplace is built of rock-faced stone, with tiled hearth and an oak mantelshelf. The staircase is separated by a carved balustrade, from which rise columns supporting archways, with spaces filled in with carved panels as transoms. Parlor is separated in a similar manner, with columns, forming an arcaded effect. This apartment, library and den have open fireplaces, trimmed with tiled hearths, Mexican onyx facings, and oak mantels of excellent design, provided with mirrors and columns. Den is fitted up with a paneled seat and bookcases. Dining-room is finished off in a handsome manner. It has a ribbed ceiling, paneled wainscoting, and divan, with china cabinets, built in on either side with leaded glass doors. The large bay window contains nook for buffet, with a stained glass window over same. The large open fireplace is handsomely trimmed, and provided with a massive carved mantel. The lavatory is conveniently located. The kitchen and pantries are fitted up in the best possible manner. The second floor contains six bedrooms, eight closets, and two bathrooms. The bedroom over dining-room is provided with a pleasing nook, with paneled seats and an open fireplace. The bathrooms are paved and wainscoted with tiles, and furnished in the best improved manner with exposed plumbing. The third floor contains billiard-room and four bedrooms. Cemented cellar contains laundry, furnace, and other necessary apartments. Mr. Frank W. Beall, architect, 825 Monadnock block, Chicago, Ill.

Our engravings were made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.

VIEW OF INTERIOR OF A RESIDENCE AT CHESTER HILL, MOUNT VERNON, N. Y.—See page 19.

THOUGH it is generally assumed that oak is the wood capable of being put to the greatest variety of uses, it is known, as matter of fact, that the pine is really the most used, on account of its great abundance; nevertheless, the timber of the oak combines in itself the essential elements of strength and durability, hardness and elasticity, in a degree which no other tree can boast—unrivaled as a material for shipbuilding, also superior in architecture, cabinet making, carving, mill work, cooperage, and innumerable other purposes, while the bark is of great value as furnishing tan and yielding a bitter extract in continual demand for medicinal purposes. But of uses for the pine, details would be well nigh endless. The timber is invaluable in house and ship carpentry; common turpentine is extracted from it in vast quantities, and immense supplies of tar, pitch, rosin and lampblack; in the manufacture of lucifer matches, and, above all, paper pulp, thousands and tens of thousands of acres of pine forests are cut down every year, and, briefly, the timber of this tree, constituting as it does the chief material of English and American builders, may be said to be more used than all other kinds of wood put together.



A RESIDENCE AT GREEN'S FARMS, CONN.—See page 18.

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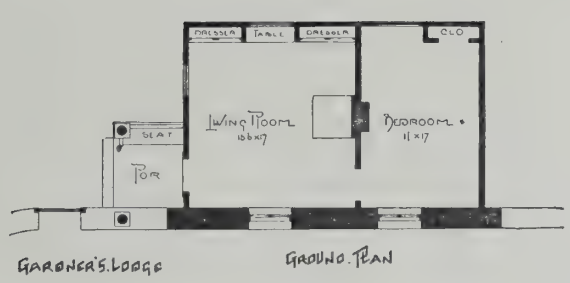
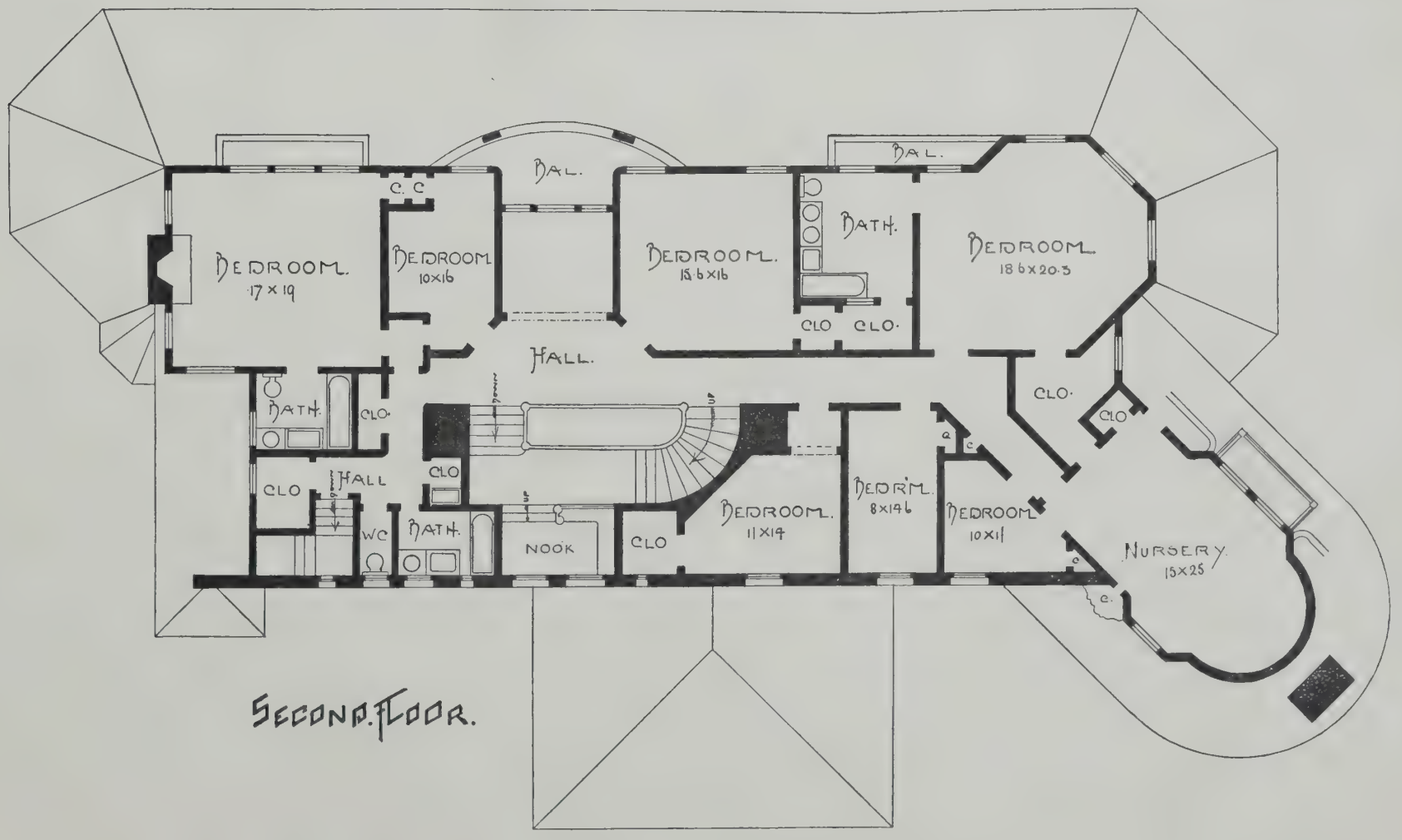


GARDNER'S LODGE GROUND PLAN



SECOND FLOOR.

RESIDENCE AND LODGE AT GREEN'S FARMS, CONN.—See page 18.

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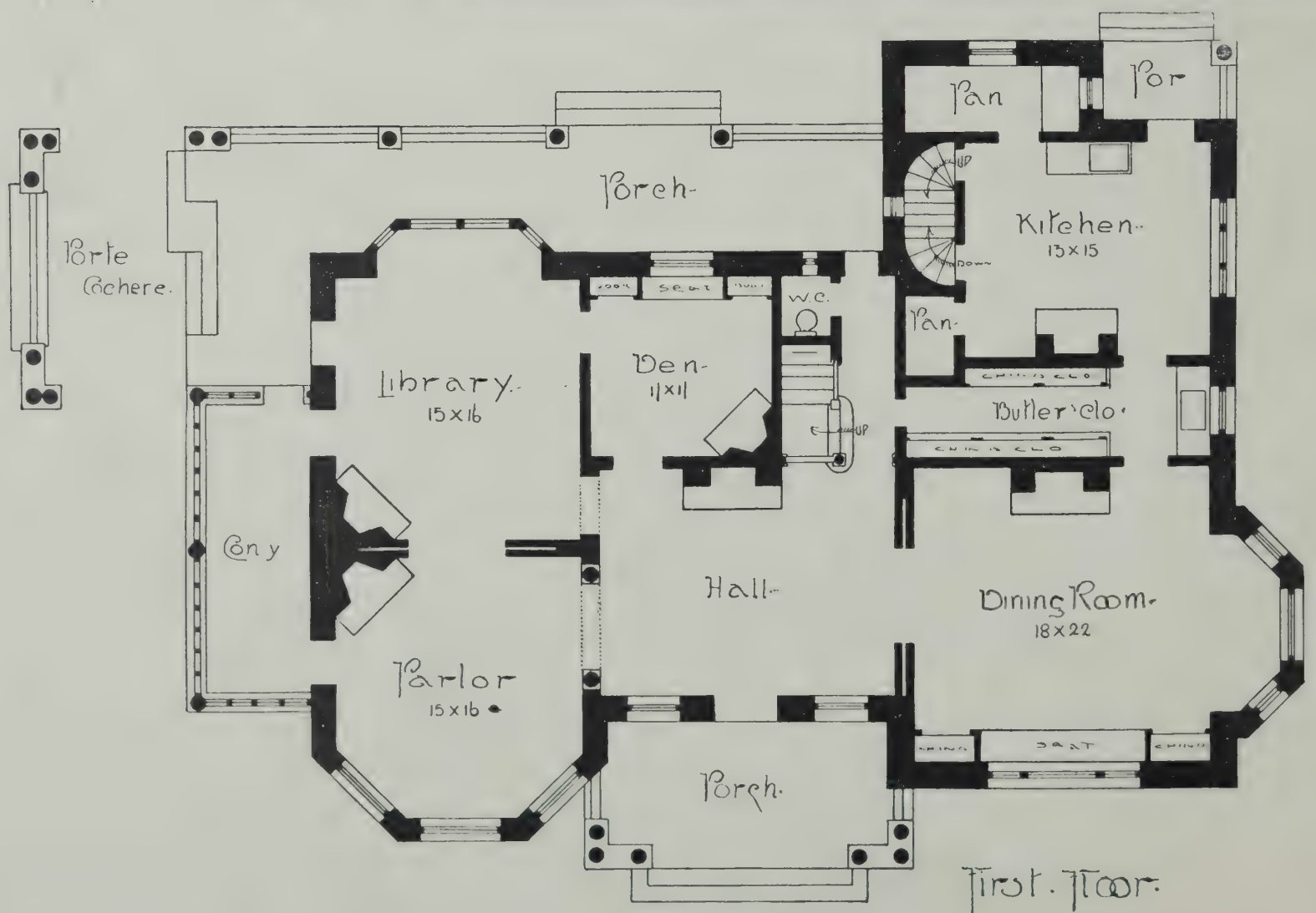

A RESIDENCE AT ORANGE, N. J. See page 19.

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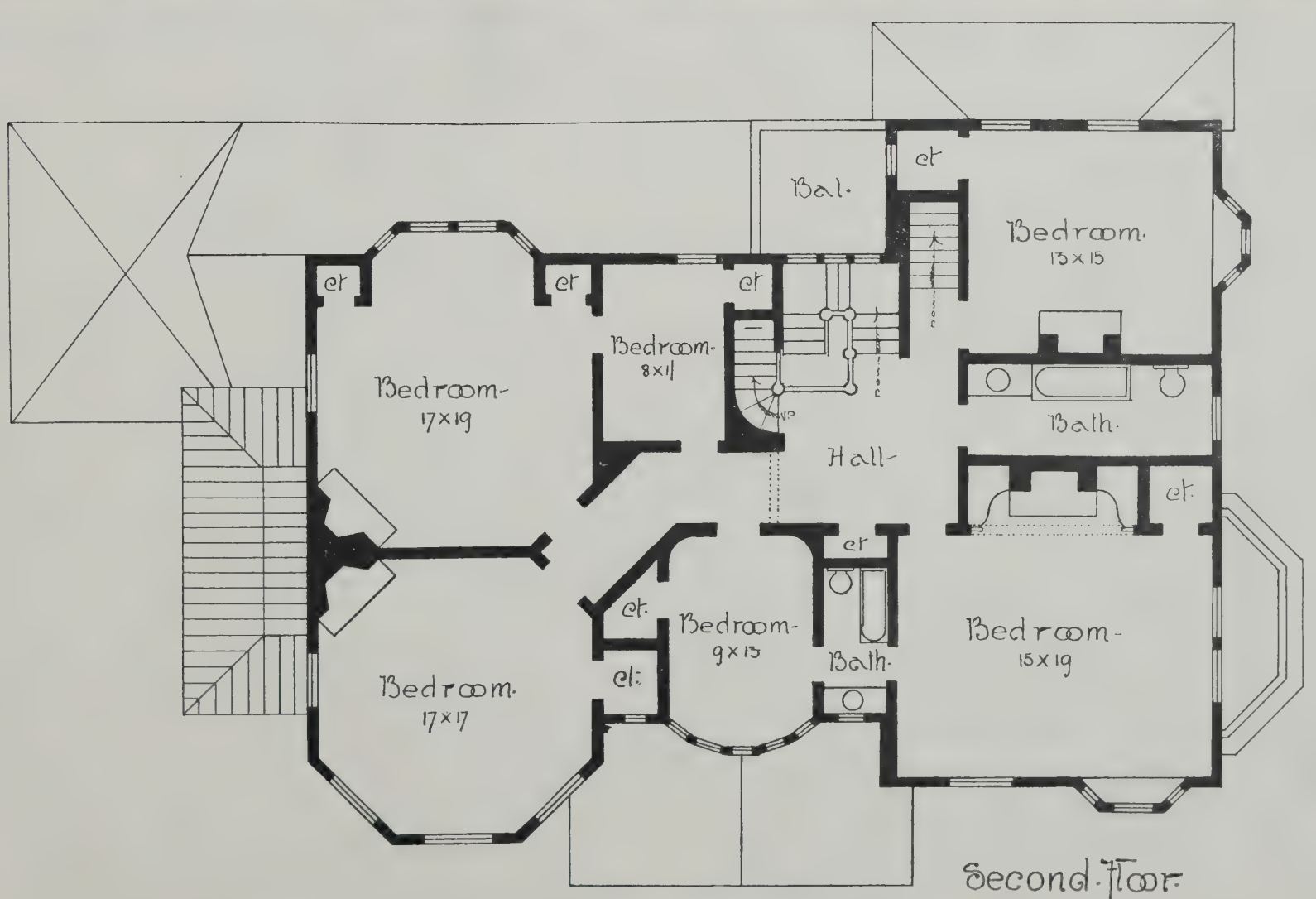

MAIN HALL OF A RESIDENCE AT ORANGE, N. J.—See page 19.

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A RESIDENCE AT HOLYOKE, MASS.—See page 18.

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A STABLE AT HOLYOKE, MASS.—See page 18.

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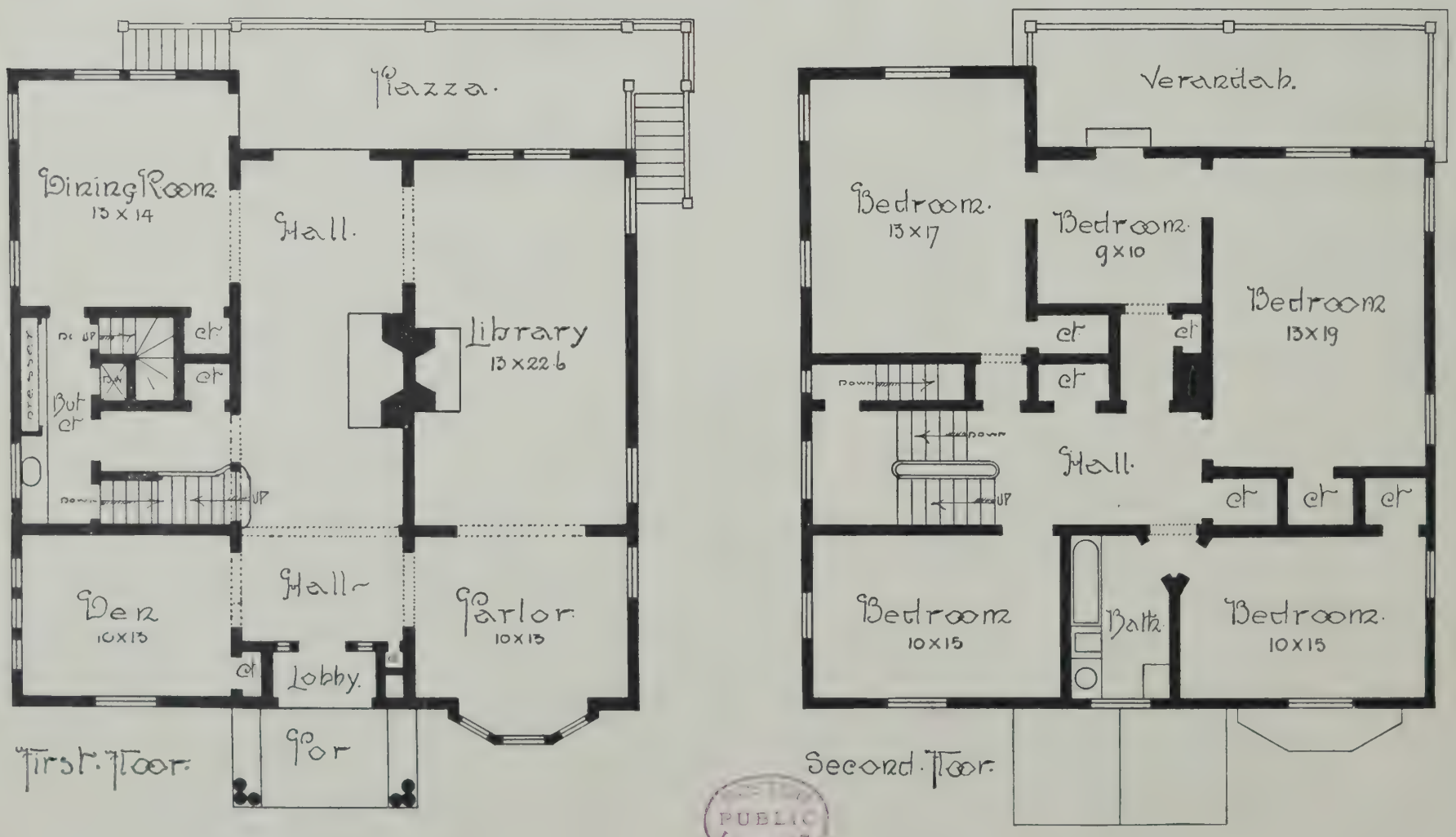

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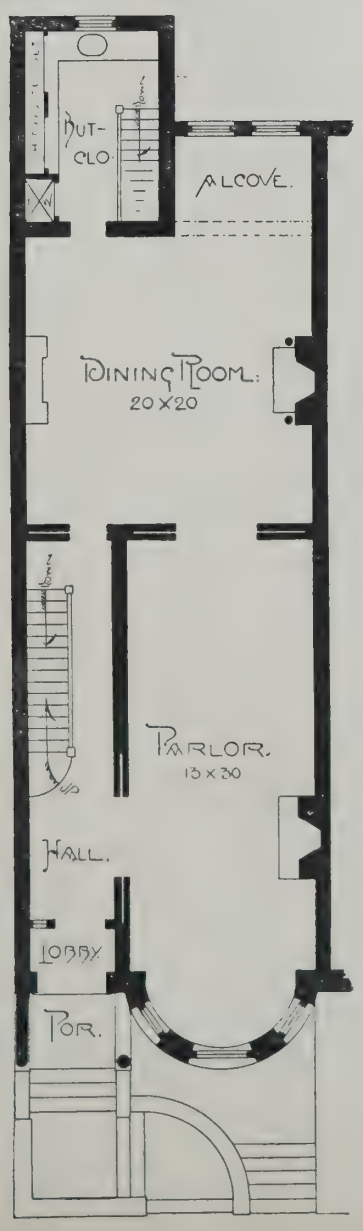
A COLONIAL RESIDENCE AT NYACK-ON-THE-HUDSON, N. Y.—See page 30.



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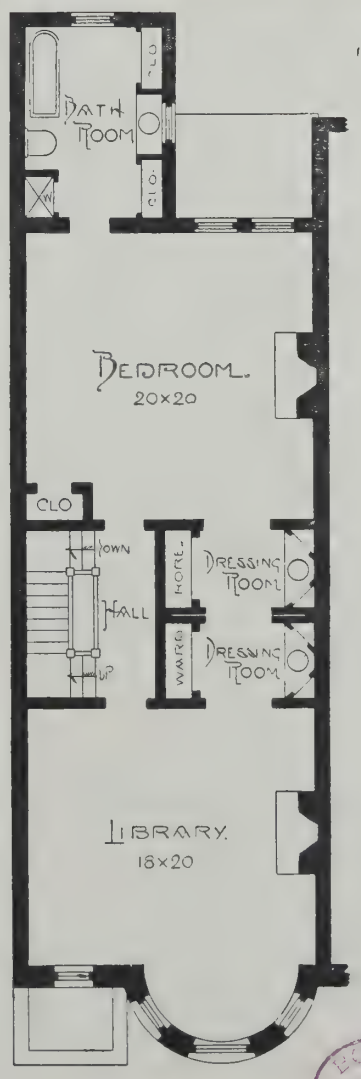

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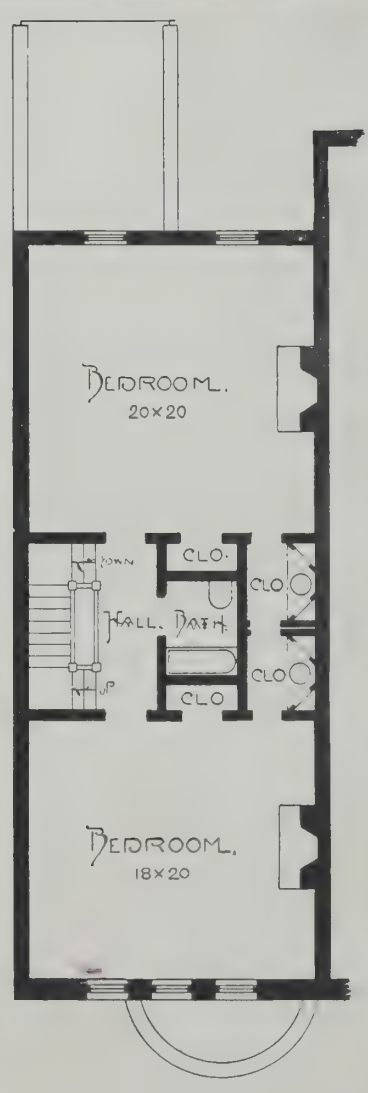

THIRD FLOOR.

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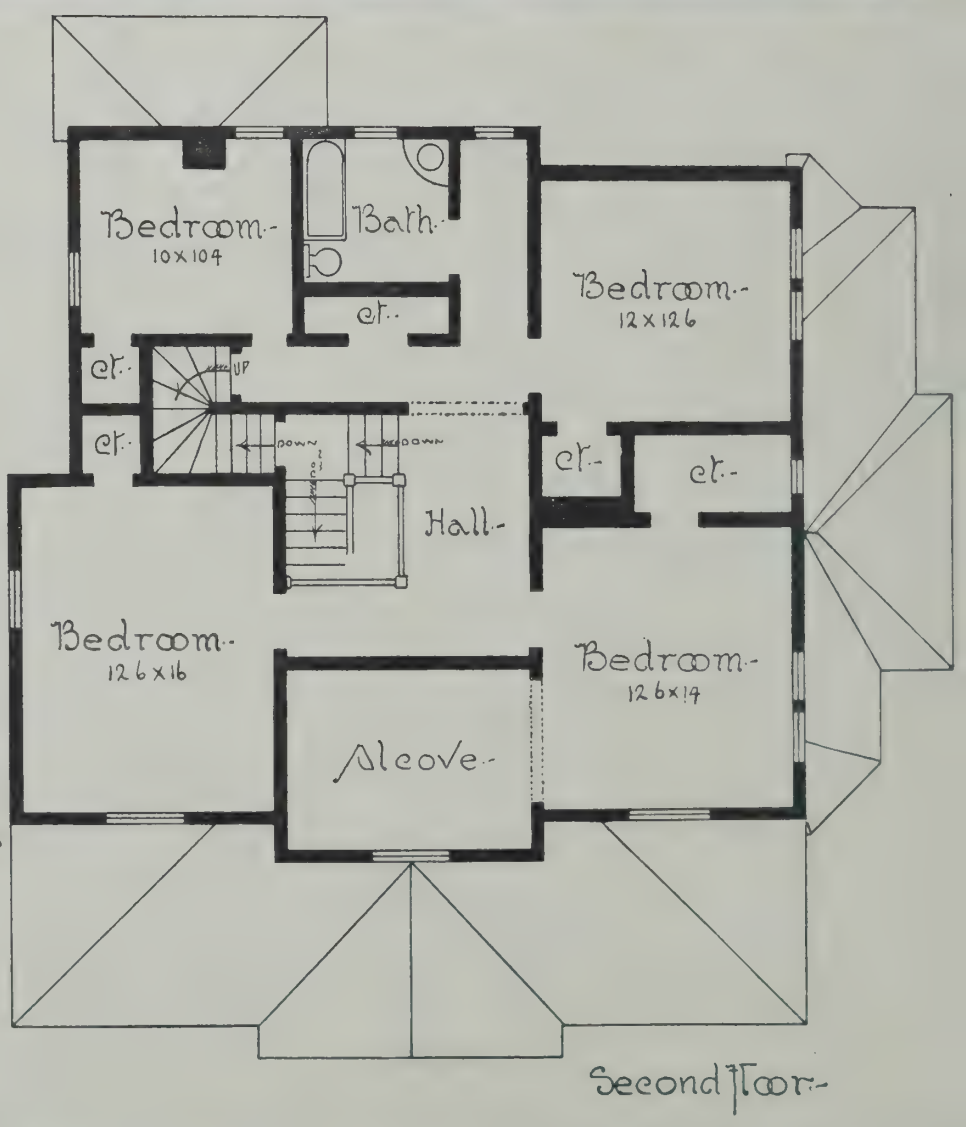
A ROW OF TOWN HOUSES, NEW YORK, N. Y.—See page 30.



A RESIDENCE AT CHESTER HILL, MOUNT VERNON, N. Y.—See page 19.

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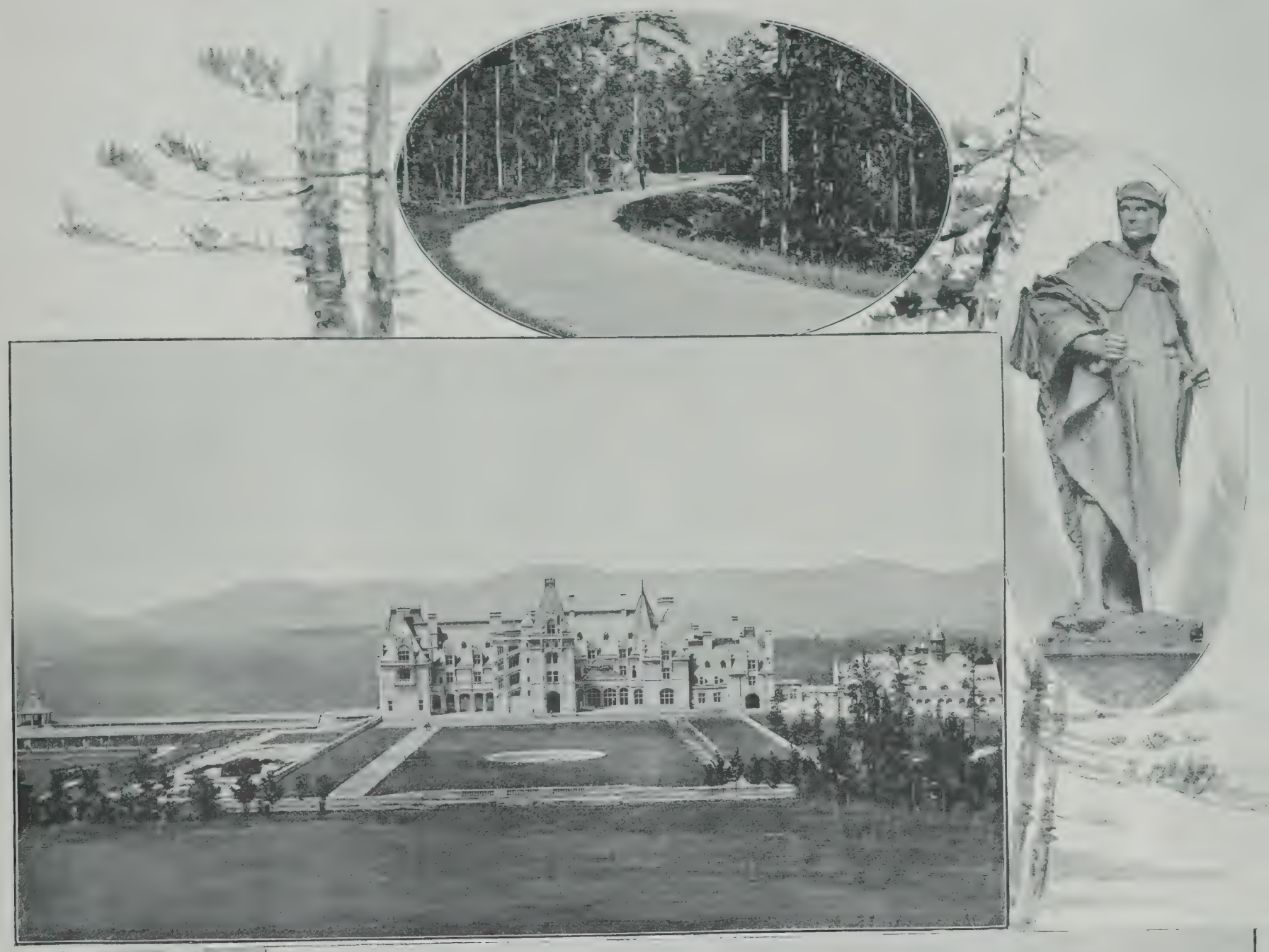

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BILTMORE, ESTATE OF MR. GEORGE VANDERBILT, ASHEVILLE, N. C.—See page 31.

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COLONIAL RESIDENCE AT NYACK-ON-THE-HUDSON N Y.

We publish on page 26 a residence, recently erected for Marshall L. Emery, Esq., at Nyack-on-the-Hudson N Y. The design is treated in the old Colonial style and although the outlines are square, they are sufficiently broken by ornamental porches, bay windows, heavy moulded cornice and window caps, all of which go to make a pleasing appearance, and an antique effect so successfully sought. The foundation is built of rock-faced stone, laid up at random in white mortar. The exterior framework is covered with sheathing, paper, and clapboards, and then painted Colonial yellow, with ivory white trimmings. The roof is shingled, and left to finish natural. Dimensions: Front, 38 ft.; side, 39 ft., not including porches. Height of ceilings: Cellar, 7 ft. 6 in.; first story, 9 ft. 6 in. second, 8 ft. 6 in.; third, 8 ft. The interior arrangement is most perfect. The broad hall, extending through the building, and communicating with the various apartments with archways is a good feature. The woodwork throughout is of white pine and is treated with white enamel. The hall is provided with an open staircase, with newel post extending to ceiling, and forming circular arches, the pilasters and posts having carved caps. There is also a broad, open fireplace, with hearth and facings of pressed brick, and mantel made from a special design. Parlor and library are well lighted, and the latter is provided with a fireplace furnished similar. Den is provided with a cluster window, with stained glass fittings. This den, hall and dining-room have paneled wainscotings. The floors are laid with hardwood, and highly polished. Butler's pantry is fitted up with dresser, bowl, and drawers, and also dumbwaiter to kitchen. The cellar contains kitchen, laundry, furnace, pantries, and storeroom, fitted up with the best modern fixtures. The second floor is provided with five bedrooms, large closets, and bathroom, the latter wainscoted, and fitted up in the best possible manner. Third floor contains t o bedrooms and storage. The house is steam heated. Cost $5,900 complete. Mr. Marshall L. Emery, architect, 74 Bible House, New York.

Our engraving was made direct from photograph of the building, taken specially for the Scientific American.

A ROW OF TOWN HOUSES, NEW YORK, N. Y.

We present as the subject of one of our engravings on page 27 a group of residences erected on Lenox Avenue, New York City. One of these houses, the fifth from the corner, and of which we give plans and description, is owned by William Hollingsworth, Esq This group of houses is one of the finest examples of domestic architecture in Harlem. They are built in an expensive manner, and nowhere, either on the exterior or interior, is there any attempt to conomize in materials or workmanship. The houses vary in size—three being 20 ft., one 19 ft., and one, the corner, 22 ft. 10 in. They are all 68 ft. deep. Height of ceilings: Cellar, 7 ft.; basement, 8 ft.; first story, 12 ft.; second, 11 ft.; third, 10 ft.; fourth, 9 ft. The houses have attractive fronts. Three are built of brownstone, and two of brick and red sandstone. The bay window and box stoop on each house are the feature of the fronts, and are handsomely carved. The interior embellishments are elegant from the entrance to roof. The plumbing, lighting, and ventilation of these houses cannot be surpassed. The vestibule is tiled in mosaic, and it has massive oak doors, with window at side, and transom over, glazed with stained glass. The hall is trimmed with oak; it has a parquet floor, paneled wainscoting, and ceiling beams. The staircase, of exquisite design, has a carved column extending to ceiling. Between this column and either partition are placed ornamental brackets, supporting transoms filled in with spindlework. The parlor is trimmed with rich mahogany. It is a spacious apartment, and it is furnished with an open fireplace. This fireplace has a tiled hearth, facings, brass trimmings, and a carved mantel, with mirror extending to ceiling. The dining-room is trimmed with oak. It is furnished in an excellent manner, with a polished floor of oak, paneled wainscot, a pleasant alcove, with roof glazed with stained glass, and a fireplace with a Colonial mantel. The butler's pantry is also trimmed with oak, and it contains an abundance of shelf room, china closets, butler's bowl, dumbwaiter, and staircase leading to the culinary department. Second floor, trimmed with maple, contains library, bedroom, dressing-rooms, and bath. The library, a spacious and well lighted room, and bedroom, have open fireplaces furnished replete. Dressing-rooms have bowls, and wardrobes with doors fitted with beveled plate glass mirrors. Bathroom is wainscoted with white English tiling, and it is handsomely appointed. There are two bedrooms, large closets, and bath on third floor, and two bedrooms, bath and billiard rooms, on fourth floor, all furnished replete. The basement contains a breakfast room, trimmed and wainscoted with oak; kitchen with a "Perfect" range, inclosed with glazed tiles, and laundry with porcelain tubs. This basement also contains other necessary apartments. Cemented cellar is provided with furnace. Mr. Frank E. Smith, architect and builder, New York.

Our engraving was made direct from a photograph of the building, taken specially for the Scientific American.

Simplicity as a Decoration.

Simplicity and harmony are the elements of beauty in architecture—simplicity in the general form and arrangement of a subject, and harmony in the collocation and combination of its various parts. Without these qualities a structure can never possess either dignity or grace, and with them it will certainly possess the attractions of both. The outline, then, most conducive to beauty in architecture is that which bounds the most simple forms. These are the parallelogramic and pyramidal, in which the lines are straight and uninterrupted throughout their whole length. The ancient monuments of Egypt, of Greece and of Rome offer the most complete exemplifications of this. No other than the long unbroken lines which bound the temples of Egypt could produce an effect so grand, and no other than the simple square and pyramidal forms could be productive of so much dignity as they possess. In the pyramids and obelisks of the same country the effect of this simplicity is even more obvious. In the temples of Greece, again, the same dignified simplicity is still predominant, for, although in them the parallelogram and pyramid are combined, they are not confused. their mass consisting of a parallelopipedon, whose ends are surmounted by vertically faced pyramids, connected by an unbroken line of ridge running parallel to the horizontal boundaries of the sides. Those of the Roman monuments which are deficient in simplicity are also deficient in beauty. Such are the triumphal arches, whose general form is broken by columns and arches which subject themselves to no commanding outline, but are all at the same time prominent features of, and excrescences from, the general composition. In the temples which are on the Greek model it is not so, nor is it so in the long series of arches in the Roman aqueducts, which are crowned and connected by commanding lines, unimpeded by projections or protuberances of any kind. The crucial form of the Pointed cathedral may be thought to detract somewhat from its simplicity and so much from its beauty, but it is an aggregation of simple forms, perfectly coherent with the tendency of the leading lines in the style which, we have seen, is vertical, and the lines are therefore not broken by the p ojected masses of the transepts. as they would be in the Egyptian and other styles, the tendency of whose commanding lines is horizontal Otherwise the Pointed cathedral is a modification merely of the form of a Greek temple, with other parallelogramic forms added to it, as towers, or pyramidal, as spires. The same principle will be found to pervade the best works of the Italian school, more or less modified according to its application.

THE AMERICAN TRACT SOCIETY BUILDING.

For many years the American Tract Society owned the building on the corner of Nassau and Spruce Streets, New York City. The building itself was an ordinary brick structure, but the offices in it were considered to be very desirable on account of the location of the building, as it was directly across from both the *Times* and *Tribune* buildings, and on the very edge of Printing House Square. The officers of the Society decided a few years ago that the land was too valuable to be occupied by a small office building which lacked the latest modern improvements, so the old building was torn down, and the splendid office building, which we illustrate on page 31, was erected in its stead. The new building was begun in April 1894, and the ironwork was started in October, 1894, and in July, 1895, some of the offices were already rented and occupied.

The plot measures 100 ft. 7 in. on Nassau Street, and 96 ft. 4 in. on Spruce Street. The building was built at an acute angle of 85°, which complicated the construction considerably. Borings to the depth of 100 ft. were made in order to ascertain the nature of the ground for the foundation. Nothing but sand was found up to a depth of 100 ft., so it was determined to erect the building on piles The footings of the foundation are 35 ft. 5 in. below the level of Nassau Street, or at what is called the permanent water-line. Two thousand spruce piles, 10 to 40 ft. in length, were driven, so as to allow for 20 tons of live and dead weight to the pile. Concrete was placed over the top of the piles in order to bond them firmly together. On top of the piles granite caps were placed; on this the brickwork of the footings were started. Cantilevers were used to support the superstructure. The building contains 23 rentable stories, counting from the Nassau Street front: the basement and cellar are undergr und. Like all the modern office buildings the skeleton steel construction was used throughout, and the walls were built of Westerly granite. The steel was furnished by the Carnegie Co., and each piece was carefully tested at the works before it was shipped. In height, the building measures 262 ft. from Nassau Street to the globes on the top of the arcade, and from the weather vane the distance is 307 ft., so that, while it is a very large office building, it is not the tallest in New York. There are two interior courts, measuring 15 x 60 and 8 x 60 ft. respectively. There are 36 offices on each of the floors from the fourth to the twentieth story. In all, there are 650 offices and stores. Access to the different floors is obtained by six elevators, which run from the first to the twentieth floors. Two of these elevators can run to the twenty-first story; from the twenty-first to the twenty-third story there is a special elevator. These are all Otis Hydraulic Elevators, and the pressure used is from 800 to 900 pounds to the square inch. The lighting plant has a capacity for 2,500 16-candle power lamps. The arcade at the top of the building is crowned by four large glass globes, which each contain an arc light of 7,000-candle power. At night the effect is very fine. The figures in the angles of this arcade are made of terra-cotta, and are 18 ft. high. As in many of the very recent office buildings, there is no attempt whatever to have an imposing hall or entrance. The vestibule opens directly into a small hall, which gives access to the elevators. The hall and vestibule are handsomely finished in Pyrenees marble. The cost of the building was about $1,100,000, and it is estimated the ground upon which it stands is worth about $700,000. The architect was Mr. R. H. Robertson, of 160 Fifth Avenue, New York City.

The Lighting of Berlin.—Berlin is probably one of the best lighted cities in Europe, and its consumption of both gas and electricity is far above the average. The central electric stations, according to recent statistics supplied electricity for 5,673 arc lamps, 121,000 incandescent lamps, and 667 motors, and the annual consumption of gas is 102,000,000 cubic metres; the craving for "more light" is not by any means satisfied, and the lighting installations go on extending. The lighting of the streets by gas dates from 1826, so that Berlin was some 30 years behind England, and nine years behind Paris. It was an English company, the Imperial Gas Association, which, from January 1, 1826, took over the street lighting for a period of 21 years, both gas and oil lamps being used. At the expiration of this term the town itself took the lighting in hand, and no trouble has, especially during the last 30 years, been spared to keep the lighting of Berlin to the front. The Siemens regenerative lamps have been extensively adopted, so have other powerful lamps, including a number of Auer lamps. Berlin (which now boasts of about 1,725,000 inhabitants) is lighted by 25,332 gas lamps; of these, 18,725 are ordinary burners, 6,003 are Bray burners, 55 Auer burners, and 549 Siemens. The aggregate consumption is 17,167,883 cubic metres, entailing an expenditure of 2,490,000 marks, or about £125,000. Berlin has five gas works, with 3,005 retorts and 21 receptacles. The number of petroleum lamps for street lighting is about 1,200. The use of electric street lights dates from 1880, when Siemens and Halske installed some lights by way of a test. The authorities were not by any means in favor of electric light, but their objections were overcome, and in 1882 one or two of the principal thoroughfares were lighted by electricity. Six years later a great move was made, the electric light being adopted for some of the most important streets and places. Berlin has now five central electric stations, in addition to which there are some 300 private installations. This brings up the number of lamps to 10,537 arc, and 203,532 incandescent lamps.—*Engineering.*

With reference to the question of water-tube boilers, the following may be of interest: Some experiments, illustrating the laws which govern the circulation of water and steam in water-tube boilers, were exhibited recently to a number of engineers at the works of Messrs. Yarrow & Co., at Poplar. "To procure a sufficiently marked circulation is one of the very first points that has to be considered by the designer of water-tube boilers, and it may be said that in early days nearly all the failures that occurred with this type of steam generator were due to a neglect of this elementary feature. In order to overcome the difficulty, pipes, which have been called 'down-comers,' have been fitted to water-tube boilers, and such boilers have been found to act well. It should be explained that circulation is necessary to prevent local overheating of the boiler tubes through water being driven off and its place not being quickly supplied by fresh water The 'down-comer' pipes, being so situated as to be subject to less heat than the steam-generating tubes, have in them 'solid' water, whilst the steam-generating tubes have steam and water. Naturally, the specific gravity of the mass is greater in the 'down-comers' than in the generating tubes, so that there is a down current in the cooler pipes and an up current in the steam generating pipes."—*English Mechanic.*

The Thermophone.

This is an electrical apparatus in which sounds are produced by the changes in the circuit due to variations of temperature. Its use is to measure temperature, particularly the temperature in a distant or inaccessible place; at the bottom of a pond, for instance. For obtaining deep sea temperatures it is useful, and it may also prove of great service in the ventilation of buildings, for by this instrument the temperature of any room in a building can be registered on a dial placed in the hall. The scientific uses of the thermophone are obvious, and it will be of great aid to physicists in determining the fluctuations in the temperature of the soil, and the difference in temperature between the water at the surface and that at the bottom of ponds or lakes.

The 5,681,801 kegs of wire nails manufactured in the United States, in 1894, were the equivalent of 253,652 tons. Almost as many tons of steel wire for fencing are also annually produced.

MR. VANDERBILT'S ESTATE, BILTMORE.

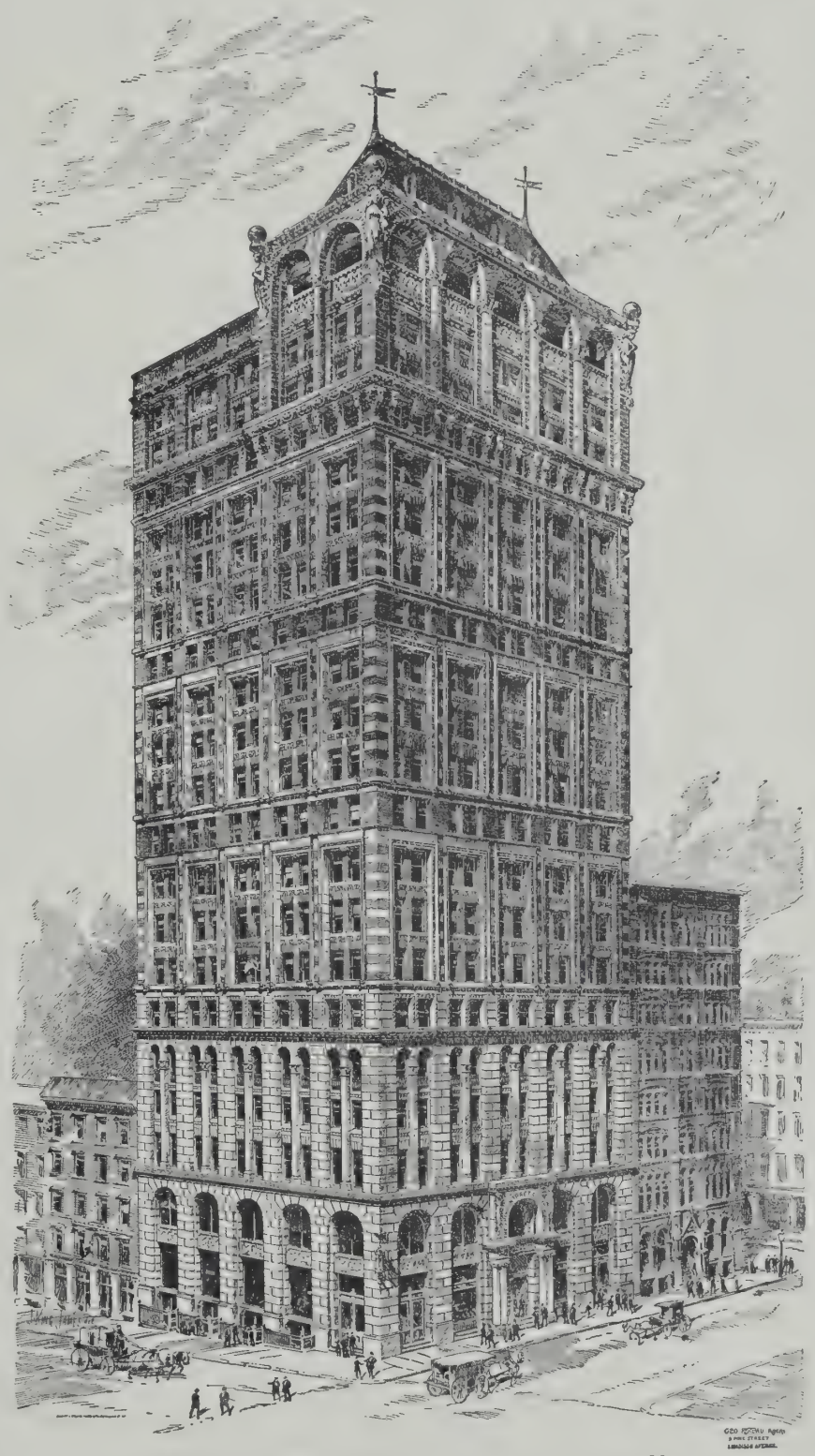
Mr. Vanderbilt's estate, Biltmore, is about six miles from Asheville, N. C. Access to the grounds may be had by procuring a pass from Mr. George Vanderbilt's resident manager. The tract of land upon which this modern castle is built consists of nearly one hundred thousand acres (more than one hundred and eighty square miles), one portion of which touches the limits of the city of Asheville, from which point it stretches over mountain and valley so far that it is possible for the owner to ride thirty-five miles straight as the bee flies from his château, without leaving his own property.

The only private estate larger than this in America is that of Dr. Seward Webb, at Ne-ha-sa-ne, in the Adirondacks, which covers two hundred and fifty thousand acres of virgin forest, streams and lakes, which is surrounded by ninety miles of 9 ft. wire fence, and which contains within its limit over fifty highland and lowland ponds and lakes. Dr. Webb preserves an immense number of trout, salmon, deer, bear, foxes, and smaller feathered game, within his cordon of wire. Mr. Vanderbilt began four years ago to construct his immense château, and although several hundred skilled workmen have been employed thereon constantly, it is not yet quite completed. There is nothing of particular interest on the road to Biltmore, which winds through romantic defiles, crosses streams, and plunges through fragrant groves of transplanted firs. After crossing the Swannanoa, one sees row upon row of trees, in regular marshaled lines. These are Mr. Vanderbilt's private nurseries. They consist of from sixty to seventy acres of land, and have been laid out and developed under the artistic eye of Frederick Law Olmsted, the world-renowned landscape gardener. Originally intended solely as a source of supply for the requirements of Biltmore, one million plants for the sides of the many woodland roads are turned out of these nurseries annually, and two million plants are now growing, which will be used to replenish the denuded hillsides. The total number of plants raised in these nurseries up to date is not much short of five million. The propagating houses show great beds planted thick, apparently with toothpicks—small slips of endless varieties of trees and plants. Mr. Vanderbilt has photographs at Biltmore of all the celebrated arboretums in the world. His plant and tree nursery will exceed all the others in size and extent. When completed, they will constitute an immense museum of living trees and shrubs, laid out in the form of a winding road, twelve miles in length, traversing all kinds of soil. This variety of soil is necessary, for the plants are from all parts of the world. The different soils are analyzed at frequent intervals, so as to find adequate reasons for failures or successes in tree and plant raising. The road in the near vicinity of the house not only leads through the wildest and most picturesque mountain scenery, but each side of it is as highly cultivated as a rose garden. And yet the random profusion and extravagance of nature are so perfectly imitated that one would not suspect the interfering hand of man. Small evergreens and trailing vines render the ground a carpet of unbroken verdure. Ram Branch (of happy Moonshiner melody) is frequently crossed on viaducts ranging in cost from $8,000 to $10,000 each. From the woods the traveler emerges upon immense clover meadows and rolling paddocks. The roads through these flock-strayed valley lands lead in all directions from the "Castle," and amount, in all, to some sixty miles in length. The "Castle" is reached after three miles of this delightful wayfaring. It looks very much like a dream fabric, standing out, as it does, from the hazy blues and greens of sky and mountain.

The mansion itself fronts east, and is situated upon a level esplanade, 700 by 300 feet. This level space has been artificially made by cutting off the summit of a mountain, and filling up the surrounding depressions. Its retaining wall, of stone, 16 feet in thickness at the base, and rising in places to the height of 40 feet, is the most remarkable feature of the esplanade. The retaining wall around this bowling green is surmounted at the south end of the house by a breast high coping of dressed stone. This bowling green was originally intended for the tennis court. Outside of the esplanade, and at the foot of its encircling wall, are the great sheds for the stonecutters and builders, and the tracks of the railroad which Mr. Vanderbilt constructed from Asheville. The outside walls of the house measure 375 by 192 feet. From the windows there are views of surpassing loveliness. The French Broad flows below, and winds away in both directions. On either side the river lie luxurious green valleys, and in them the stream narrows into pebbly rapids, or widens into placid lily-padded lagoons. Beyond the valley rises the sharp, symmetrical cone of Pisgah, and the line of summits rising constantly from it ends in the 6,000 feet of Balsam Mountain. Far away are the misty peaks of the Great Smoky Range. To the northeast extends the valley of the Swannanoa all the way to the famous Black Mountain chain. To the right the valley is flanked by the high and graceful Swannanoa Mountains. In the far distance lies the Swannanoa Gap, through which the railroad enters the mountain defiles. Toward the south, where all is gentle, peaceful, and in charming color, the mountains withdraw to a distance, leaving an open country, dotted with farms, until, far away, the hazy curtain made by the indistinct forms of the Blue Ridge is drawn around the scene along the South Carolina border. This is the very heart of the fabled abode of the primitive North Carolina "cracker" and "moonshiner," the home land of Mrs. Burton Harrison's heroine. It is unnecessary to state that game preserves will be plenty, and that in time hundreds of deer will roam at will through forest and meadow.

This palatial residence was built by and under the direction of the late R. M. Hunt, of New York City. The style is French Renaissance, and the material used is Bedford stone. The motive of the building seems to have been taken from the château at Blois.

The exterior of the château is very picturesque, as the sky line is broken by towers, mullioned windows, statues and gargoyles. On a nearer approach the eye is attracted by the large amount of fine stone carving. Probably the most pleasing feature of the eastern façade is the winding stair tower, which is at the left of the main entrance. This tower is very suggestive of that in the museum at Nuremberg. The building is really divided into six sections; in one is the library, in the second the private study of Mr. Vanderbilt and the picture gallery, in the third is the music room, salon, breakfast room, kitchens, etc. In the fourth section is the main entrance, the great living hall, and, of course, other rooms in the upper stories. In one of the views is a reproduction of a magnificent statue of St. Louis which adorns one of the main halls. Located opposite to it is a statue of another patron saint of France, of so she may be called, Jeanne d'Arc. Under the main entrance is a large swimming pool and lounging room. The other sections contain a winter garden and great banquet hall, the bachelors' quarters, billiard and smoking rooms, gun rooms, offices, etc. The banquet hall is the most imposing room in the entire building. It is 72 ft. by 42 ft., and the ceiling is 65 ft. high; it has a most elaborate marble mantelpiece. The ceiling of the library is decorated by a painting by an old master. The mantel is made of green marble from Japan, and the fireplace is so constructed that the stairway leading from the guests' chambers above is built down the middle of the chimney to the mantelpiece. The breakfast room is wainscoted with Numidian marble. The winter garden is a charming place; the marble floor is sunk three feet lower than the rest of the first story, so that one might look into this garden from nearly all of the principal rooms on the ground floor, the sides being of plate glass. In the centre of the garden is a beautiful fountain. Even the roof is of French plate glass, nearly an inch thick. Mr. Vanderbilt's private apartment is finished in Louis XIV. style. The mantel in the smoking room is a very old mantel, and, indeed, the whole house is being filled with fine objects of art collected by its cultured owner. A colonnade leads to the sunken garden, which is a very beautiful feature of the grounds. The columns are already covered with ivy, the gardener having planted it at both the top and bottom of the columns. There is a large stone terrace in front of the house, and in the esplanade is a fountain, with a basin 30 ft. in diameter. Dotting the margin of the ascent to the house are nine drinking fountains. The idea of this picturesque ascent was suggested by an old castello in Italy. It is hard to tell where house ends and stable begins, for the latter is joined right on to the house, and is beautifully built. The interior of this stable is finished with white enameled brick, such as most people are glad to have round their fireplaces. During his periodical trips to Asheville, Mr. Vanderbilt lives entirely in his private car, which is replete with all of the luxuries of home. We present on page 29 several illustrations of the extensive property at Biltmore.



AMERICAN TRACT SOCIETY BUILDING.—See page 30.

Gigantic Chandelier.

The great chandelier dome of the German Parliament building, in Berlin, says an exchange, has recently been completed, and will now be put up in the place it is intended for. Artistically, as well as technically, it is of astonishing perfection, and represents the best efforts of the architect, sculptor, electrician, and metal worker. It is constructed in the mediæval ring shape, of which we still find examples from the eleventh and twelfth centuries, in some of the great monuments of that time. The ring candelabrum, representing the ring of the walls of Jerusalem, the Heavenly City, with gates and towers as described in the Apocalypse, which can still be seen at the cathedral, in Aix-la-Chapelle, is the nearest approach to a large, ornamental candelabrum, although it was placed there more than seven hundred years ago.

From these models architect Dedreaux has designed the great ornamental candelabrum for the Parliament, which is not less than 26 ft. in diameter. Its circumference is so large that a good-sized dancing floor could be erected within the space covered by it. The colossal ring shows a wall crowned by turrets and porticoes, with original ornaments, twelve massive gates piercing the wall. Within the doorway of each gate some famous German is represented by a lifelike statue.

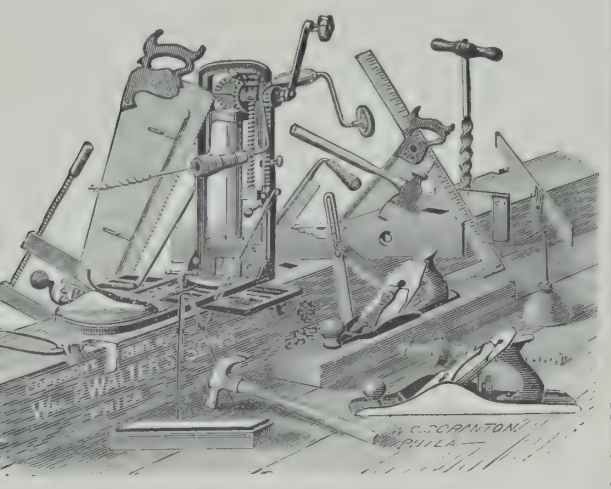
THE Keasbey magnesia sectional coverings for all heated surfaces have received the following high commendation from the superintendent of the car department of the Lehigh Valley Railroad: "Before boilers were covered, we used, on an average, 3 tons 17 cwt. of coal in 24 hours. Since they were covered, we use 3 tons 10 cwt., showing a saving of 7 cwt. in 24 hours."

The Brooklyn Institute Museum.

THE corner stone of the great museum building of the Brooklyn Institute of Arts and Sciences, on the Eastern Boulevard, Brooklyn, N. Y., facing Prospect Park, was laid on December 14, by the mayor of the city, with appropriate ceremonies.

WOOD WORKERS' TOOLS AND FOOT POWER MACHINERY.

The firm of Wm. P. Walter's Sons, of 1235 Market Street, Philadelphia, was established in 1831, and their recently issued catalogue affords splendid evidence of the steady growth of the business during this long



WOOD WORKERS' TOOLS.

period. The accompanying engraving is from the title page of the catalogue, but is only suggestive of the hundreds of tools illustrated and described in its pages. The firm also supply foot power machinery of the most approved makes and latest design.

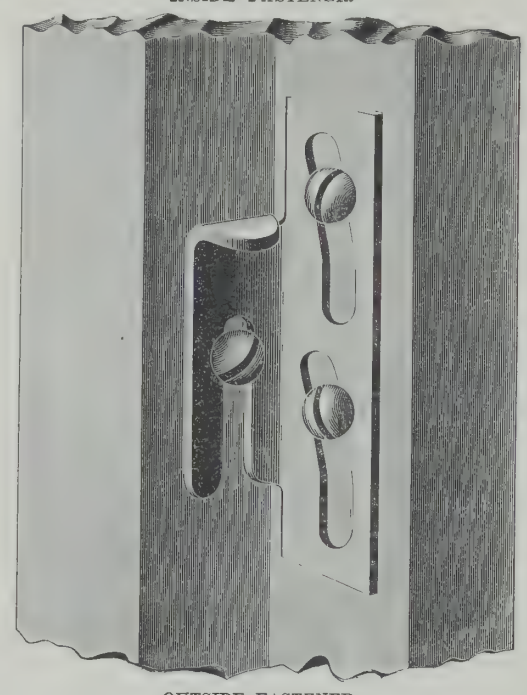
STATUARY MADE OF SHEETS OF METAL AT THE ATLANTA EXPOSITION.

The accompanying illustration shows a large number of metallic statues that were exhibited at the Atlanta Exposition by Mr. W. H. Mullins, of Salem, Ohio. The central lion is one of the largest works of art that have been made from sheets of metal. At the right of the lion is a statue of Columbus, a duplicate of one that stood in one of the buildings at the Chicago Exposition. Other statues represent Electricity, Sculpture, Painting, Agriculture, the Seasons, Music, Justice, Liberty, and many other subjects. On top of the building is Germania, holding a wreath in her hand. Statues of this kind were used with great success in the adornment of the grounds. Among the well-known statues made by this house is that of Diana, which crowns the tower of that immense structure, Madison Square Garden, which occupies a whole square in the city of New York. The statue of Hermann, made of thick sheets of copper, is 22 ft. high, and is the finest statue that has been made of sheets of metal in this country. It was made for the city of New Ulm, Minnesota. The statue of Hidalgo, ordered by Gen. Bernardo Reyes, was also made by Mr. Mullins, and was erected to the memory of the patriot, in a square of the city of Monterey, Mexico. Work of this kind is made of sheets of stamped copper fastened to a frame of copper bars, thus making a light and durable statue. After it is finished, the appearance of old copper is given to the metal, making a very effective piece of statuary.

IMPROVED STORM WINDOW FASTENERS.

The illustration represents inside and outside fasteners, the latter for use where it is not convenient to employ the inside fastener. The inside device can be adjusted in a minute without the use of a screw driver or other tool than

INSIDE FASTENER.



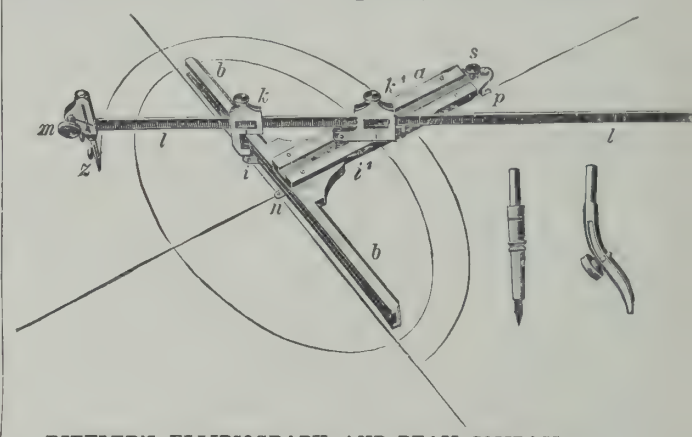
OUTSIDE FASTENER.

MOORE'S STORM WINDOW FASTENER.

a small hammer, doing away with the inconvenience of climbing a ladder, and the windows are held in place more securely than in any other way yet invented. The cut shows the method of attaching the fastener, the flat surface being screwed to the storm sash, and the point mashing on to a screw in the edge of casing. The fastener is driven down with a small hammer, thereby drawing the window as tight as desired With the outside fastener. the flat surface is screwed to the edge of storm sash, the hook mashing on to a screw in the casing, and the fastener being driven down with a small hammer. These fasteners are made at a small cost by the Stanley Works, New Britain, Conn., and 79 Chambers Street, New York.

RIEFLER'S ELLIPSOGRAPH AND BEAM COMPASS COMBINED.

The apparatus shown herewith consists of two main parts, the frame and the beam compass. The former forms a T, with slots in both arms, in which the clamps, i and i', slide; these hold the beam, l, l, with pen, or pencil, z; it is divided and can be adjusted in the clamps and secured with the screws, k and k'; the frame can be separated in two parts, a and b, for keeping in a case. The firm F. Weber & Company, 1125 Chestnut Street, Philadelphia, is the sole agent for this instrument. For use, the frame is set and screwed together, and the middle



RIEFLER'S ELLIPSOGRAPH AND BEAM COMPASS COMBINED.

part at n set in the centre of the intended ellipse, the front edge of the arm, b, b, to cover exactly the major axis; then secure in position by screwing down s till needle point of the same pierces the paper; adjust the beam, l, in clamp, i', to the length of minor axis, and secure with screw, k'; then adjust beam in clamp, i, to the length of major axis, adding 20 mm. to the same, the axis of this clamp being so much nearer to the drawing point, and secure with screw, k; set pen or pencil, z, to correct height by means of screw, m, and draw one-half of the ellipse; after this, lift drawing point, z, release screw, p, reverse the instrument by swinging it to 180° around point, n, reset screw, p, and drawing point, z, and draw other half. The instrument permits to draw all kinds of ellipses and circles, from 10 to 560 mm. major diameter; the pen with bent point to be used for ellipses of less than 22 mm. diameter.

In 1742, Benjamin Franklin invented the Franklin stove, which is still in use in some old Pennsylvania houses.

STATUARY MADE OF SHEETS OF METAL AT THE ATLANTA EXPOSITION.

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A COLONIAL RESIDENCE AT STAMFORD, CONN.—See page 46.

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THE

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The Annual Exhibition of the Architectural League of New York.

In our lavish praise of those arts which have had, if not their birth, at least their practical development in the present century, we are in danger of forgetting that there are other and older arts which are fully as essential as these to our physical, mental, and moral well-being—arts which were already hoary with age when these later mechanical arts were born. In our oft-repeated enumeration of the blessings which have resulted from the development of the steam engine and the telegraph, we are in danger of forgetting that noble and historic architectural art to which mankind in all ages have owed so much. As compared with the arts which are purely mechanical and modern, it is not merely older and more essential, but it more completely environs the life; more persistently obtrudes itself upon the sight.

Particularly is this true of the dwellers in the city, where the eye is forever, consciously or unconsciously, recording a succession of architectural photographs. The rural population, which spends the hours of daylight almost entirely in the open, is surrounded on all sides, and at all times, by the beauties of nature. Sunlight and shadow, hill and dale, forest and field, river and stream, in all their endless variety of beauty, obtrude themselves on the view; but in the city the prospect is forever composed of, and bounded by, the forms in which the architect may, with varying skill—or the lack of it—have raised that aggregate of brick, stone, and mortar which we call a city. Unlike his brother toiler in the country, the city resident spends but little of his time in the open. Not merely during the daylight hours, but for the whole twenty-four, he is shut in, amid such surroundings of architectural comfort and beauty as the taste of the designer and the depth of his own purse may allow. For the city dweller, the panorama of nature, which is so often beautiful, and at all times full of interest, is replaced by a succession of pictures in brick and stone, of which it must in truth be confessed that they are too seldom beautiful, too often barren of interest, and tiresome in their monotonous repetition.

The ancients were fully alive to the value of architectural beauty, and among them there was no art that took higher rank. Sculpture was so intimately associated with this its sister art, that it could scarcely be defined as separate. It was the constant aim of the classic architect to raise his buildings in forms, which, while they subserved the purposes of utility for which they were built, should at the same time be expressive of grace, dignity, and repose, and appeal to the artistic sense of the people.

The generosity of the Architectural League of New York, in throwing open to the public its annual collection of designs, is in every way praiseworthy. There could be no finer object lesson in what is best in architecture than is afforded by a few hours' stroll through the galleries of the Fine Arts Building, in West Fifty-seventh Street. There are in all about one thousand exhibits, and they include, in addition to plans and exteriors of buildings, one whole gallery full of choice mural decorations and designs for stained glass windows; besides statuary, bronzes, pastels, and exquisite work in the many other branches of art which contribute in any way to architectural effect. In the south gallery will be found Mr. C. Y. Turner's prize design for the mural decoration of the entrance to the new Manhattan Hotel, on Forty-second Street. It is named "The Triumph of Manhattan," and represents a central feminine figure, seated in the centre of a broad balcony, beyond which are seen the waters of the North and East Rivers. Very effectively grouped to the right and left are the worthies who have most largely contributed to the fame and prosperity of Manhattan, among whom may be seen many of the colonial and later historical characters. The colors are quiet and pleasing, and the whole composition will repay careful study. A large part of one end of this gallery is taken up by a splendid burnt wood composition, entitled "Adoration of St. Jeanne d'Arc," by J. W. Fosdick. It measures 10 x 18 ft., and the figures are life-size. The work is executed upon basswood, and in place of brush and color a heated steel tool is used, the lines being burnt into the wood. The result is a kind of semi-bas-relief, worked in lovely shades of dark and light brown; and the total effect is at once soft and delicate, yet clear and vigorous, and is in every way highly artistic. As fine a piece of drawing as any in the whole collection is a cartoon for a library window by Frederick Wilson, entitled "The House of Aldus, Venice, A.D. 1502." The grouping of the figures and their individual pose are in perfect harmony, and there is an unconscious ease and abandon in each figure which makes the whole cartoon instinct with life and feeling. The work of Elihu Vedder is represented by five panels, designed for the Congressional Library at Washington; and, as illustrating the best work of American artists in mural decoration, these panels will well repay careful study.

The purely architectural section of the Exhibition will be found in the Vanderbilt Gallery, and to all those visitors who have the architectural advancement of their country at heart this section will be specially gratifying and full of promise. The designs divide themselves broadly under the three heads of ecclesiastical, domestic, and commercial and public architecture, the greater number belonging to the latter two classes. A chaste and harmonious design is that of the interior of the Church of St. Mary the Virgin, West 46th Street, New York, by N. Le Brun & Sons. It is Early Gothic in style, and the pier arcade and the whole features of the nave are carried continuously round the eastern apse, which is octagonal in form. The designs in domestic architecture are marked by that varied and picturesque treatment which has caused this style to become recognized in Europe as a novel and clearly defined national type of great excellence. The growing tendency to abandon the use of wood for the more durable brick and stone has, of course, exercised a sobering effect upon the profusion of details; but the freedom and unconventionality of the general designs are still a marked feature.

As was to be expected in a metropolitan exhibit, the larger part of the designs relate to commercial and municipal buildings. They are of great merit individually, and as a class collectively they show that the present trend of this country in its larger and more important buildings is towards a final adoption of the Renaissance, or of a modified classic architecture, as the distinguishing national type. There are several elevations shown of the modern exaggerated office buildings, which by their ungainly height are beyond any possibility of successful architectural treatment. The design for such a building, on Broadway and Ann Street, by George B. Post, shows how much may be done by a skillful architect to mitigate the inherent ugliness of a twenty-five story block. The whole front is freely pilastered, each row of pilasters covering the height of two stories. Another twenty-five story building by Geo. F. Tilden, is not so successful. The attempt to taper the upper portion of this tower—for the structure is nothing less—by extending the roof lines down through several stories, is not satisfactory. The Park Building, Pittsburg, by George B. Post, is one of the finest designs that Mr. Post has ever produced, and the treatment is characteristic. The subdivisions, both vertical and horizontal, are in very pleasing proportion. One of the most interesting designs, in its details and as a whole, is that for the Bowling Green offices, by W. & G. Audsley, of 55 Broadway. The style is stated to be Hellenic Renaissance, and it is an attempt to adapt Greek architecture to modern commercial requirements. As compared with the pure Greek style, one notes the absence of the Greek capitals, and the substitution of a richly carved capital, which is Egyptian in form and Greek in its details. In some of the pilasters there is also a reminder of the Egyptian methods; indeed, the combination would be more aptly named Egypto-Grecian. There is some precedent for this combination, which, as worked out by Messrs. Audsley, is certainly effective and harmonious, in the fact that the Greek builders borrowed at times from the Egyptians. Whether the style will recommend itself to American taste remains to be seen. Undoubtedly this design is full of merit, and will attract a large share of favorable criticism.

Public buildings are represented by the competitive designs for the Minnesota State Capitol. Renaissance, rather than pure classic, is the predominant style in these designs, and they form a magnificent collection.

A very ambitious and striking design by Bruce Price is entitled "Project for Erecting upon the Square of a New York City Block a Monumental Public Library of the Capacity of the Boston Public Library." It is a splendid specimen of the decorated Greek style, and it shows what a wealth of color can be used, and what beautiful effects can be produced, in this combination of color and carving. The details of the design are infinitely varied, and the "tout ensemble" is harmonious and grand. The only possible criticism that can be made is that the whole pile has perhaps too much "lift"—is too aspiring to be truly reproductive of Greek ideas.

PARISH BUILDINGS, ST. GILES'S, OXFORD.

We illustrate from the *Building News*, on page 35, the parish buildings of St. Giles's, at Oxford, England, and from designs prepared by H. Wilkinson Moore, architect.

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SOME TOWN HOUSES.

On pages 44 and 45 will be found floor plans and engravings of some town houses, erected on West End Avenue, New York City, N. Y. The corner house, of which we give plans, was erected for E. H. Talbott, Esq. The design is treated in the Romanesque style. The first story is built of brownstone with faces left rough as they come from the quarry, with the exception of the door and window openings. The upper stories are built of wash brick, with trimmings of similar stone. Above this, the building is made impressive by a tower and a ste p pitched roof, covered with Spanish tiles. The cornice and dormer windows are of copper. Within the house, the arrangement is excellent, and the first story contains the first and second drawing-rooms, broad hall and dining-room, which can be thrown together if desired. The most striking feature of the interior is the hall and staircase. This hall is trimmed with oak. The walls are paneled the full height, and are finished with a carved cornice. The ceiling is ribbed, forming panels, which are filled in with rare bits of carving. The broad staircase is built of oak, and it has a massive carved newel with candelabrum of wrought iron and lantern of antique design. The walls and ceiling of vestibule are paneled, and the floor is laid in mosaic. The nook has a paneled divan. The drawing-rooms are treated with ivory white and gold in a delicate manner. The trimmings are carved exquisitely. The fireplace is furnished with white onyx tiles. Mexican onyx facings, and an over mantel laid in mosaic. Dining-room is trimmed with white mahogany. It has a paneled wainscoting ten feet high, and ceiling beams. The fireplace is provided with a tiled hearth, Mexican onyx facings, and a mantel with beveled plate mirror, etc. These apartments have parquet floors and are highly polished. The windows on this floor have transoms glazed with delicate tinted glass, shedding a pleasant light over the various apartments. The butler's pantry has a counter shelf of Italian marble with bowl. It also contains an ice box, dresser, china closets, dumbwaiter, and a private stairway from basement to fourth story. The second floor contains four chambers and bathroom, and the third floor contains three chambers and bathroom. These apartments are trimmed with sycamore. The fireplaces are fitted up complete. The The bathrooms are wainscoted with Italian marble, and are furnished in the best possible manner with exposed plumbing, all nickelplated. The chambers have large closets. The fourth story contains three servant bedrooms and a billiard room. The basement contains kitchen, pantries, laundry, furnace, and other necessary apartments. Mr. Charles T. Mott, architect, 137 Broadway, New York.

Our engravings were made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.

A STONE COTTAGE.

We publish on page 40 a unique cottage which has been recently erected for Francis Cushing, Esq., at Cushing's Island, Maine. The building is constructed of rock-faced field stone, laid up at random. There are several bay windows thrown out with latticed window effect. The gables are built of wood, and covered with shingles and stained sienna. The roof is covered with slates. Dimensi ns: Front, 48 ft.; side, 41 ft., not including piazza. Height of ceilings: Cellar, 8 ft.; first story, 9 ft.; second, 8 ft. 6 in.; third, 8 ft. There is a cemented cellar under the whole building, and it contains kitchen, laundry, pantries, and all necessary apartments, fitted up in a first-class manner. The hall is finished in cherry, and it contains an ornamental staircase turned out of similar wood. The archways between hall and the other apartments have spindle transoms. The parlor, library and dining rooms are also finished in cherry, and have hardwood floors. Library is furnished with an open fireplace, built of brick with facings of same and hearth of slate. Bookcases are built in on either side of fireplace. Dining-room is provided with a cozy nook with seats. The second floor contains four bedrooms and large closets, while the third floor contains two bedrooms and trunk room. Messrs. Fassett & Tompson, architects, Portland, Maine.

Our engravings were made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.

A SUBURBAN DWELLING.

Our engraving on page 39 illustrates a unique design for a suburban dwelling, which has been recently erected for William C. Lee, Esq., at Newark, N. J. The design is treated in the modern cottage style, with Colonial detail, and the bay windows, thrown out at random, together with the latticed windows, go to carry out a quaint and picturesque effect. The underpinning and first story are built of brick, laid up with red mortar in a neat manner. The second and third stories are shingled and finished natural; the roof is shingled similar. Dimensions: Front, 35 ft.; side, 44 ft., not including piazza steps. Height of ceilings: Cellar, 7 ft.; first story, 9 ft.; second, 8 ft. 6 in.; third, 8 ft. The first floor is trimmed with yellow pine, finished natural, while the second and third floors are trimmed with whitewood and finished similar. The reception hall is a well lighted apartment, with paneled divan, ribbed ceiling, and an ornamental staircase. This staircase is provided with a seat and newel post extending to ceiling, with a carved capital.

PARISH BUILDINGS, ST. GILES'S, OXFORD.—See page 34.

A DWELLING OF LOW COST.

We present on page 38 engravings and floor plans of a model design for a suburban dwelling which has been erected for S. O. Lacey, Esq., at Binghamton, N. Y. The engravings show a design treated in the gambrel roof order, with Colonial detail. The underpinning and balustrade at piazza are built of Warsaw bluestone; the superstructure, of wood, is covered with clapboards on first story, and painted olive green, with white trimmings. The second and third stories are shingled and stained a mahogany color. Roof shingled and stained moss green. Dimensions: Front, 32 ft. 6 in.; side, 36 ft. 6 in., not including piazza. Height of ceilings: Cellar, 7 ft.; first story, 9 ft.; second, 8 ft. 6 in.; third, 8 ft. The hall is trimmed with quartered oak. It has a paneled wainscoting, a nook with paneled seat, and an ornamental staircase with carved newel posts. This staircase is lighted effectively by stained glass (leaded) windows. The fireplace is built of brick, with tiled hearth and facings, and a mantel carved in a handsome manner. Hardwood floor. The parlor is treated in white and gold. Dining-room is trimmed with Southern pine, and finished natural. Butler's closet and kitchen are wainscoted and trimmed with yellow pine, and are fitted up and furnished respectively. The second floor is trimmed with white pine and treated in colors. It contains a large hall, four bedrooms, and bathroom; the latter is wainscoted with Southern pine, and fitted up complete. There are one bedroom and ample storage on third floor. Cemented cellar contains furnace, laundry, and other necessary apartments. Cost $1,800 complete. Mr. S. O. Lacey, architect, Binghamton, N. Y.

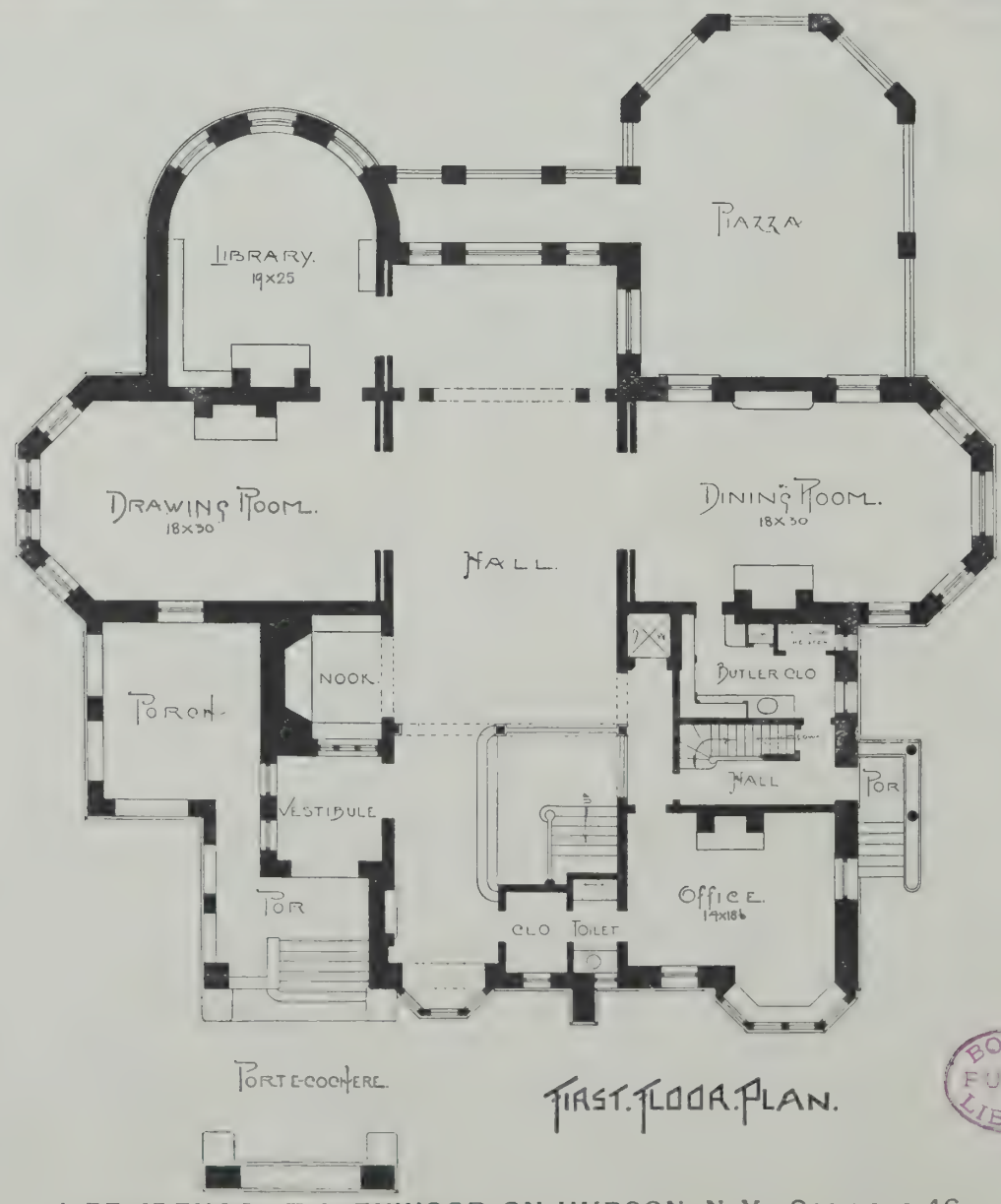
Our engraving was made direct from a photograph of the building, taken specially for the SCIENTIFIC AMERICAN.

A DWELLING OF MODERATE COST.

The library is a spacious apartment, with window seat and an open fireplace. This fireplace is furnished with a tiled hearth, facings of hand-painted tiles, and a mantel with columns extending to ceiling, with carved caps. Dining-room is fitted up with a paneled wainscoting, a heavily beamed ceiling, and a massive brick fireplace, with hearth, facings, and mantel of same. Kitchen, lobby, and pantries are wainscoted, and furnished with all the best fixtures complete. Second floor is provided with four bedrooms, six closets and bathroom; the latter is wainscoted with white English tiles, and is provided with the usual porcelain fixtures and exposed plumbing. Third floor contains one bedroom and ample storage. Cemented cellar contains furnace, laundry and other apartments. Cost $5,900, including furnace and everything complete. Mr. Stanley S. Covert, architect, 19 Park Place, New York.

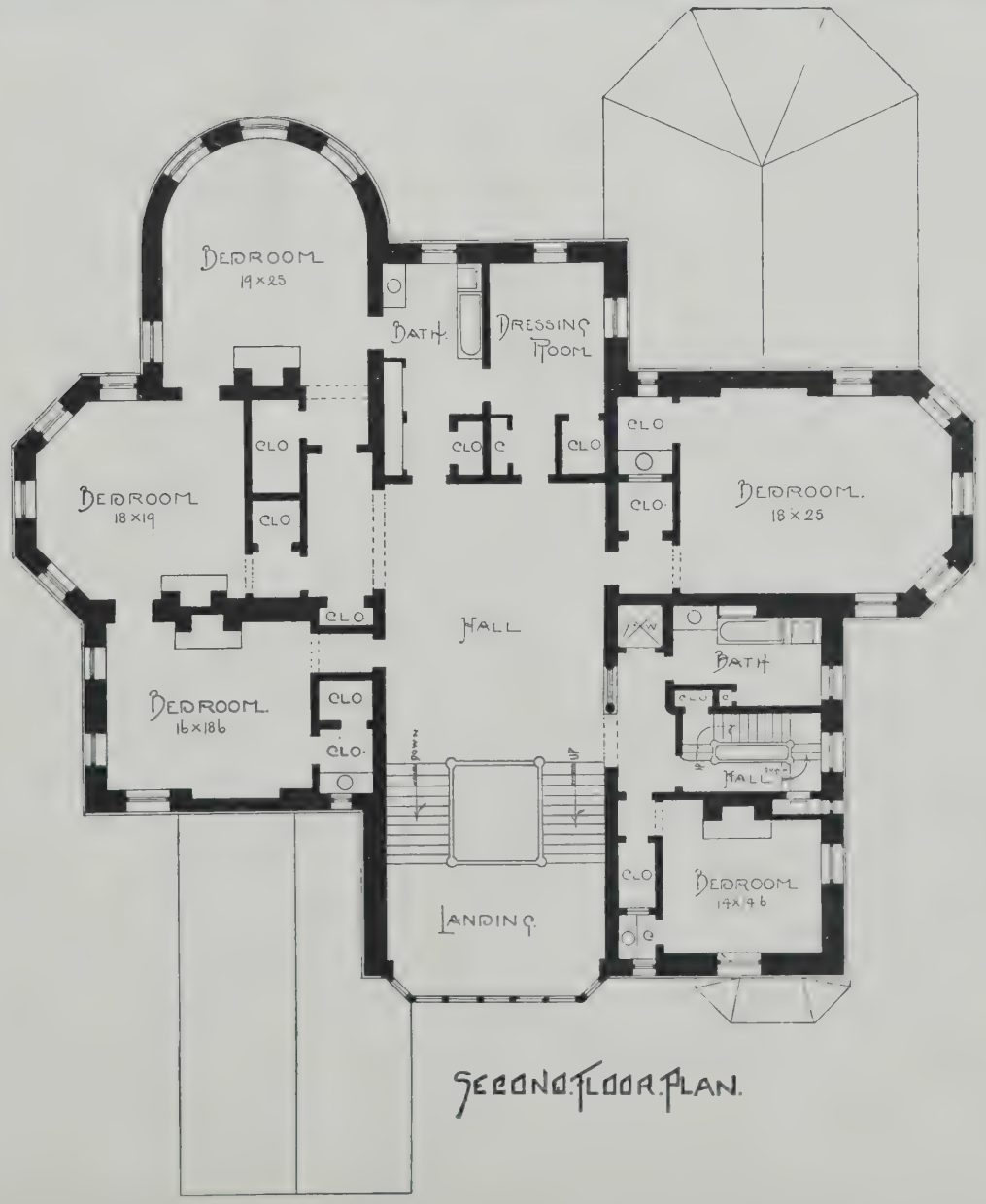
Our engravings were made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.

DO NOT run pipes in exposed situation. Keep them away from the outer air, and from air shafts unless properly protected. To protect, cover with non-conducting covering, or box in and fill the box with sawdust or other suitable material. If in the ground, and not below the frost line, it should be boxed in and well protected also.—*Master Steamfitter.*



BOSTON FUEL LIBRARY

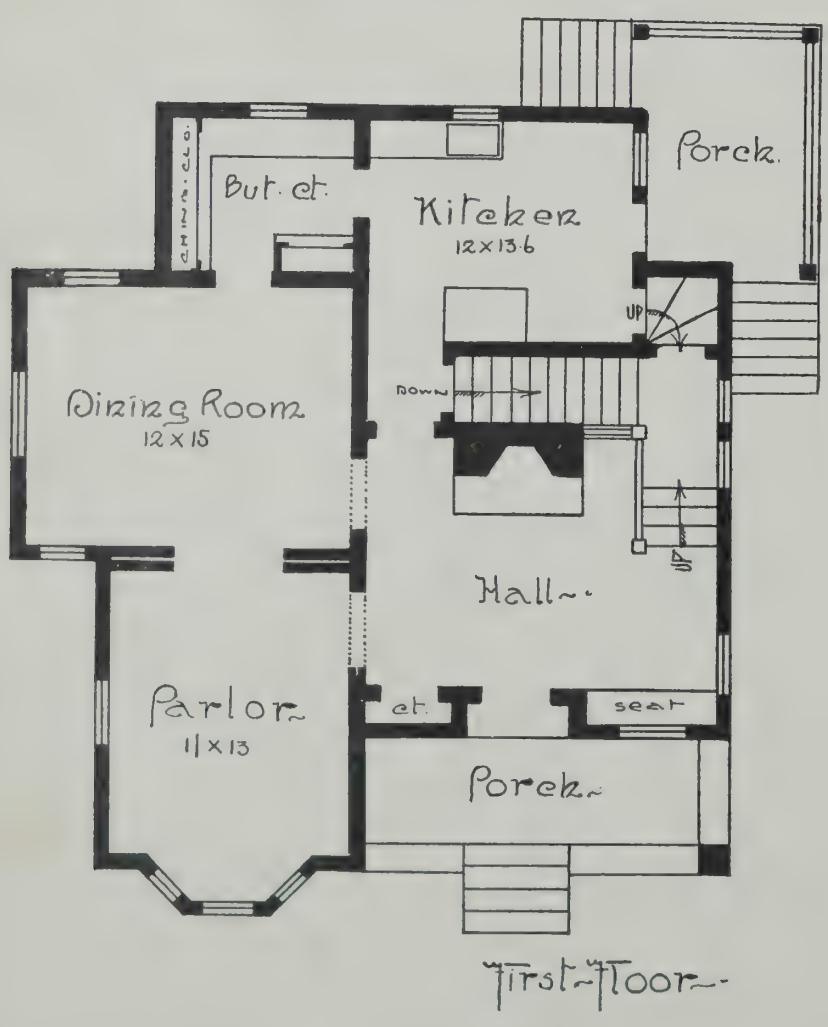
A RESIDENCE AT GLENWOOD-ON-HUDSON, N. Y.—See page 46.



SECOND FLOOR PLAN.

BOSTON PUBLIC LIBRARY

A RESIDENCE AT GLENWOOD-ON-HUDSON, N. Y.—See page 46.



A DWELLING OF LOW COST.—See page 35.

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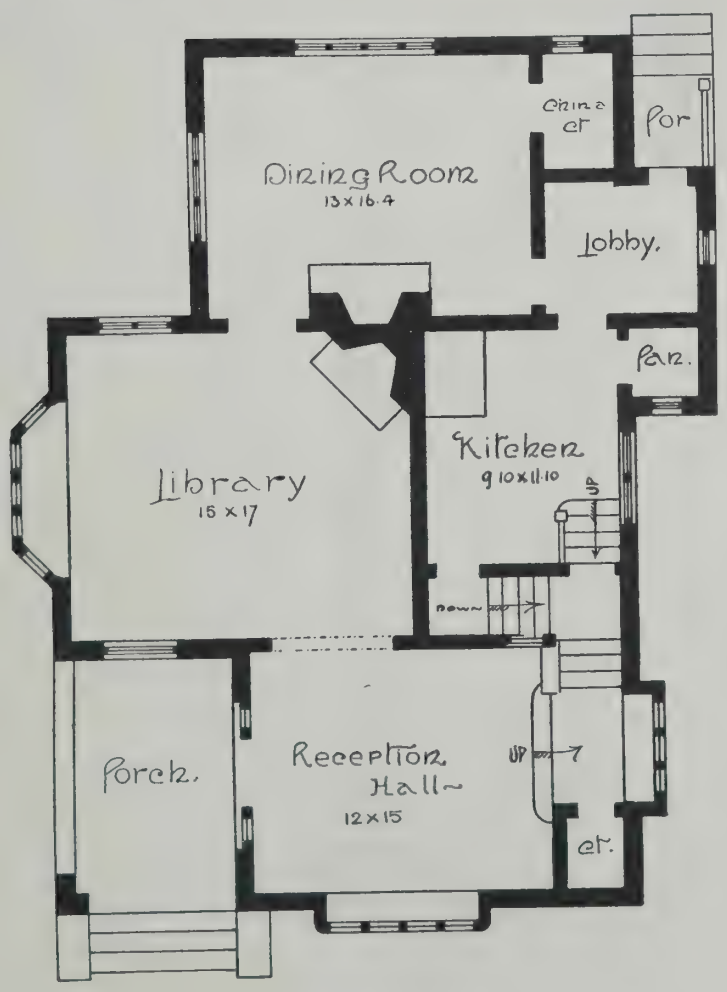
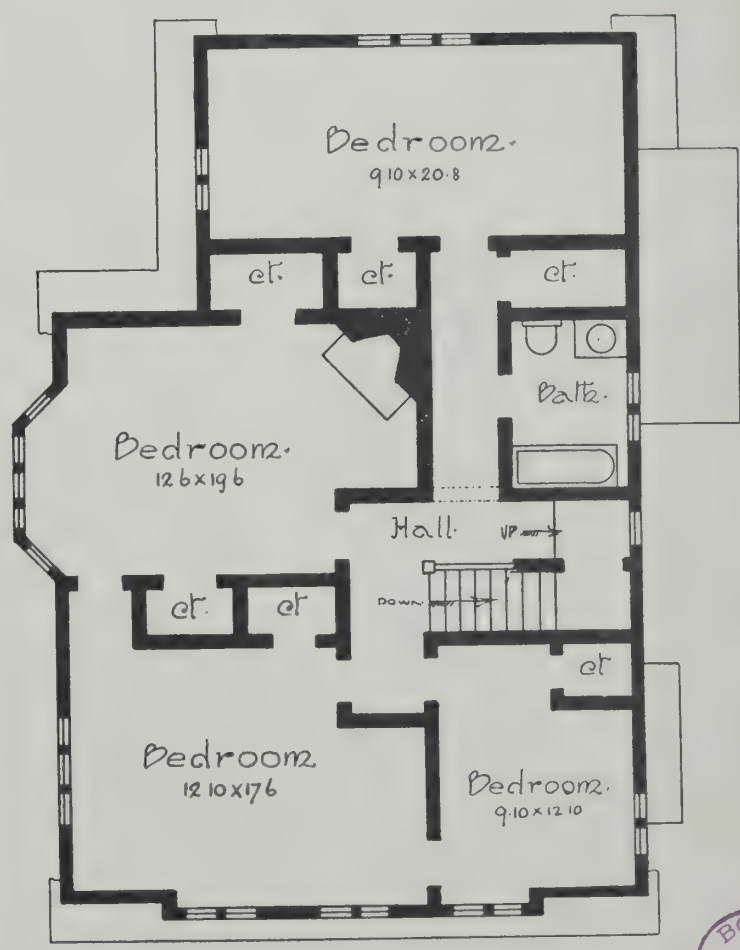
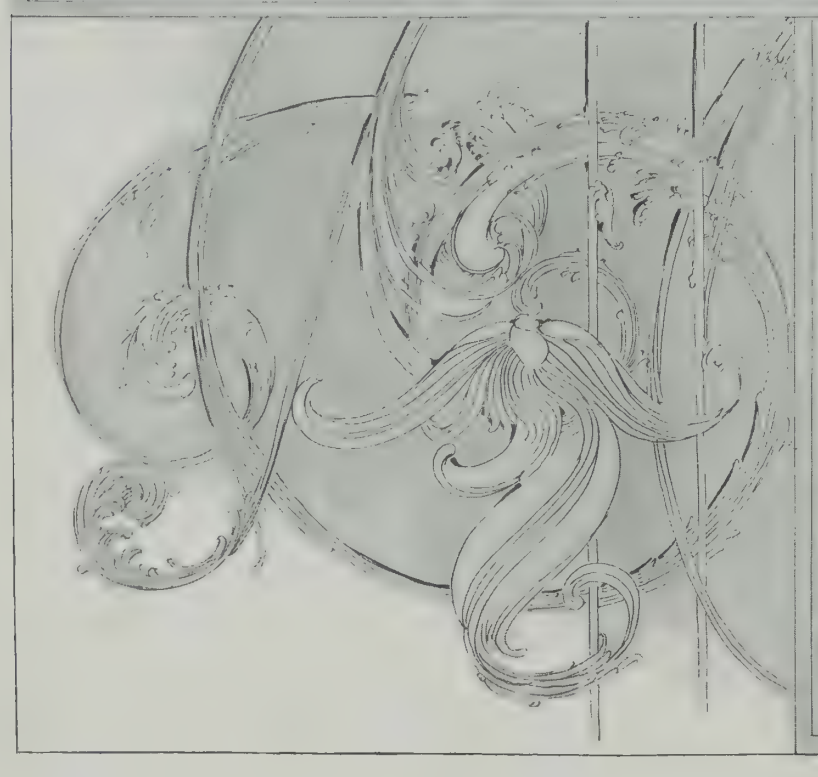


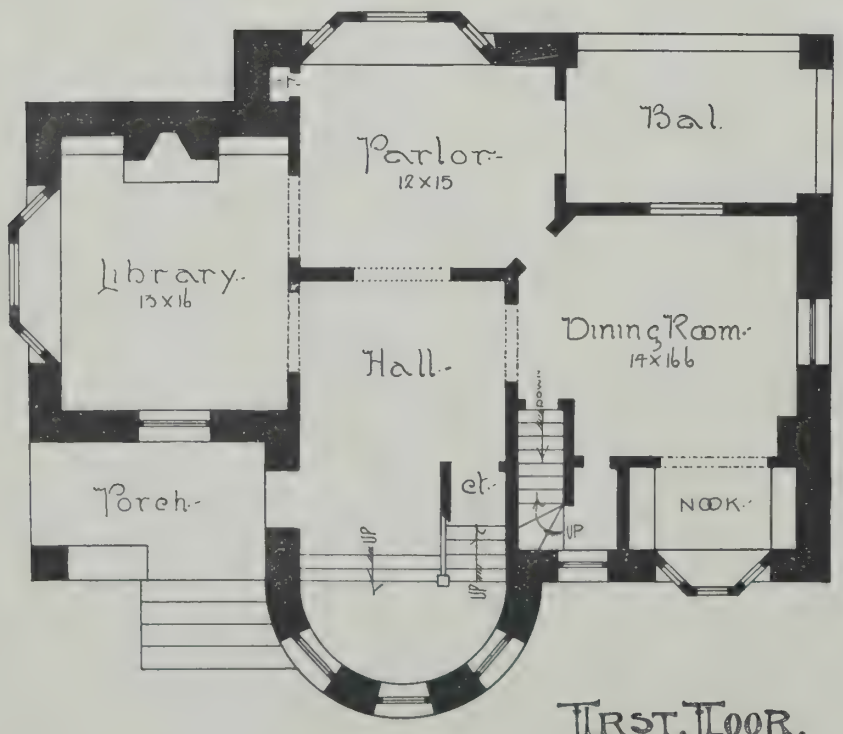
First-Floor.



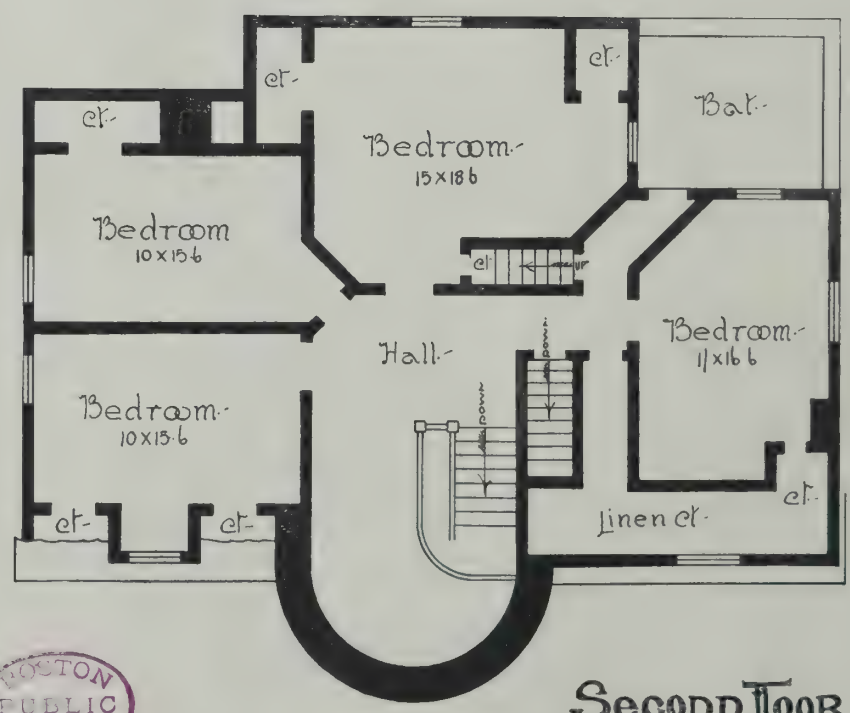
Second-Floor.

A SUBURBAN DWELLING.—See page 35.





First Floor.



Second Floor.

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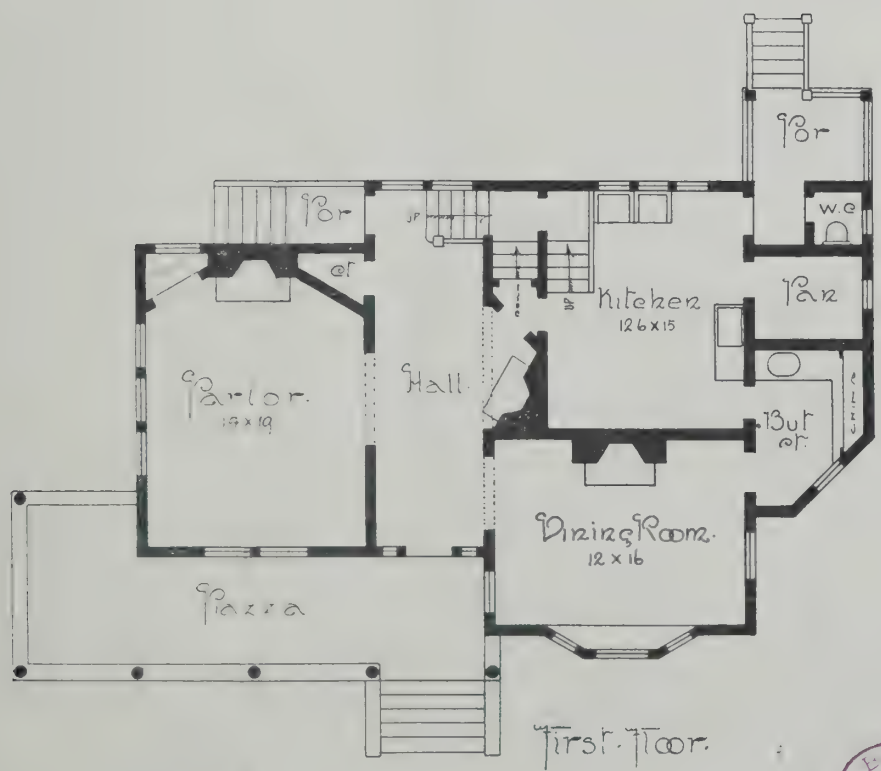
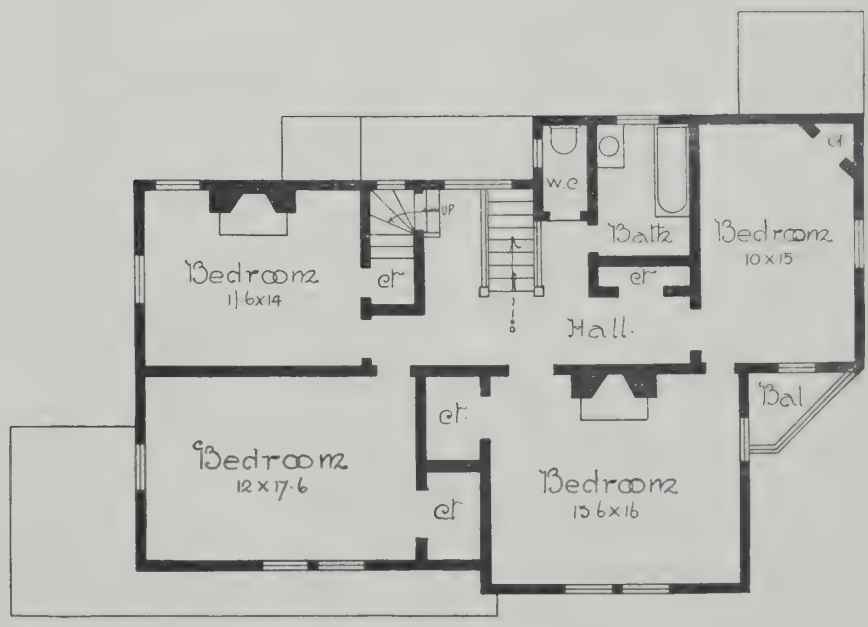
A STONE COTTAGE, CUSHING ISLAND, ME.—See page 35.





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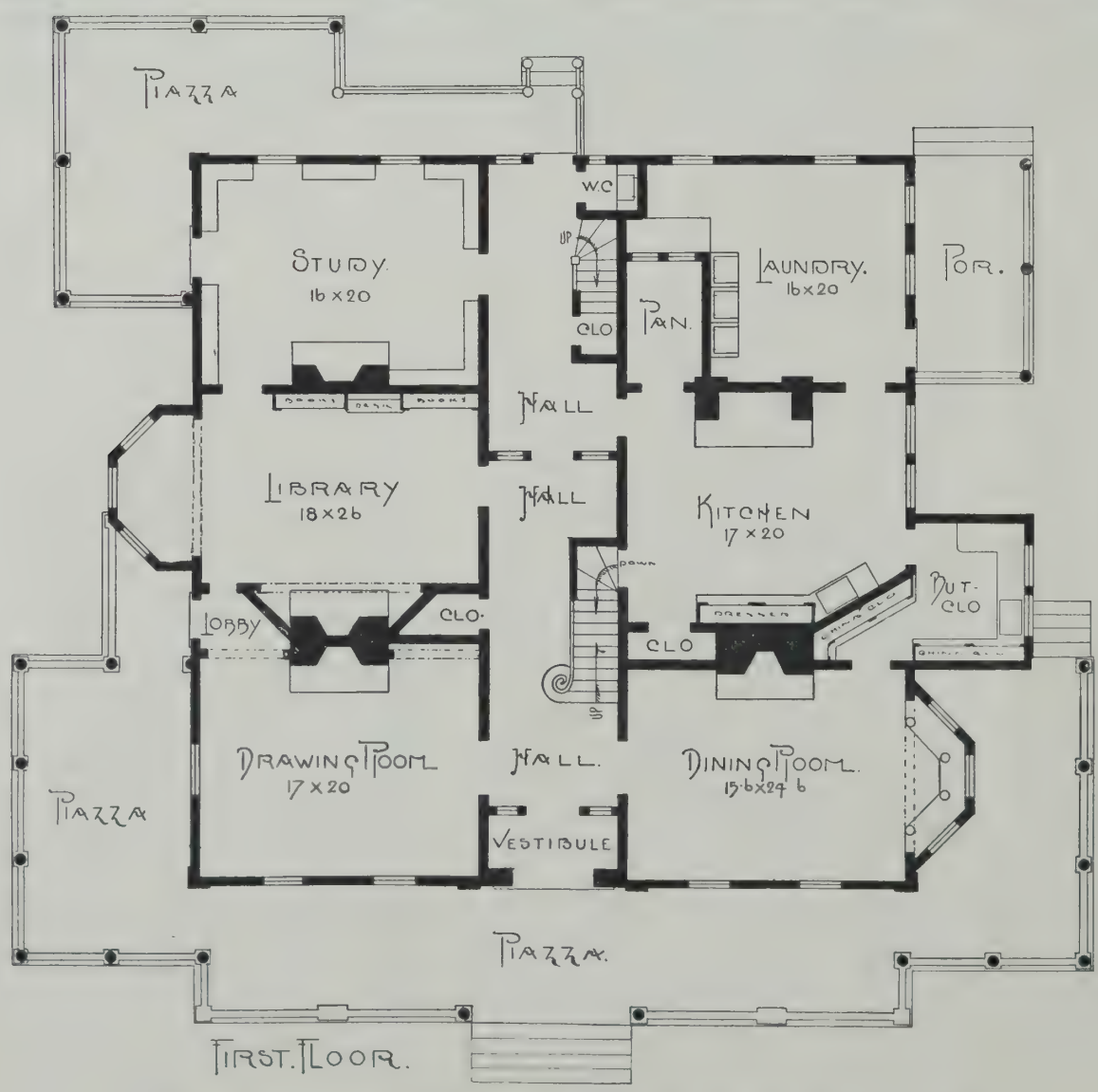
AN ENGLISH COTTAGE.—See page 46.



A COLONIAL RESIDENCE AT STAMFORD, CONN.—See page 46.

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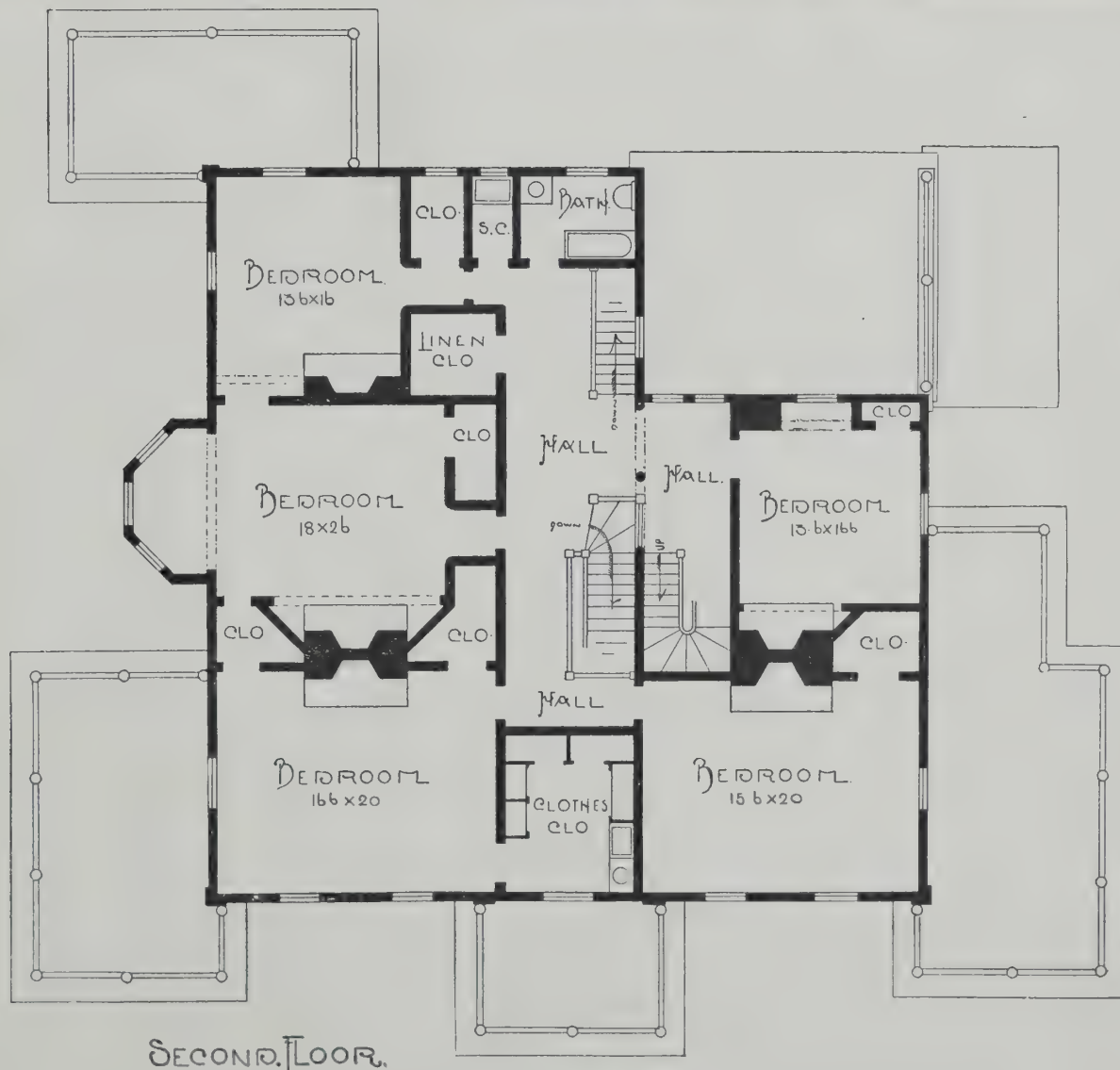
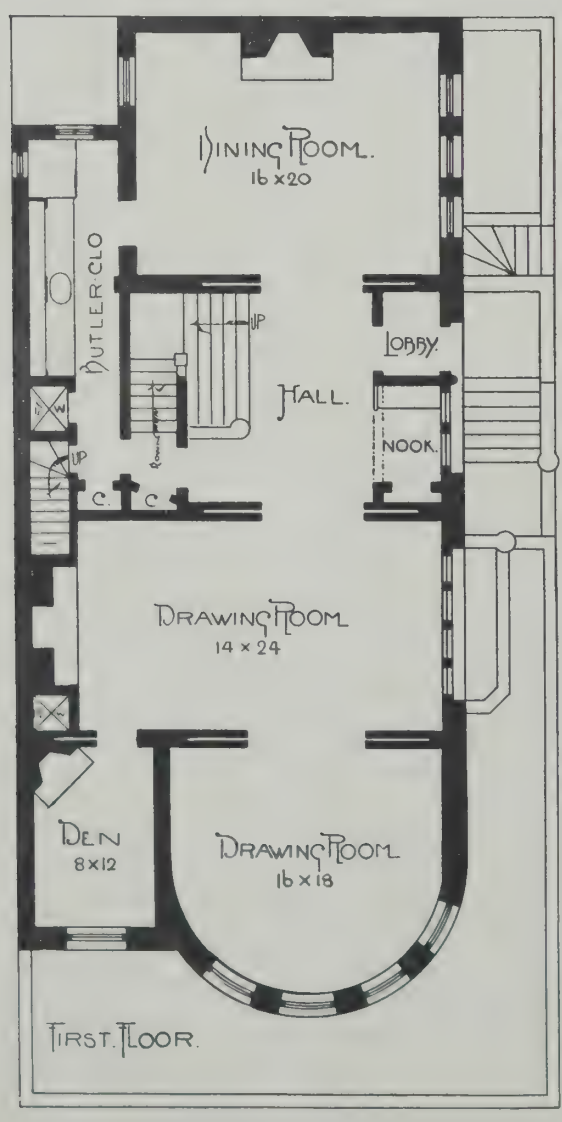
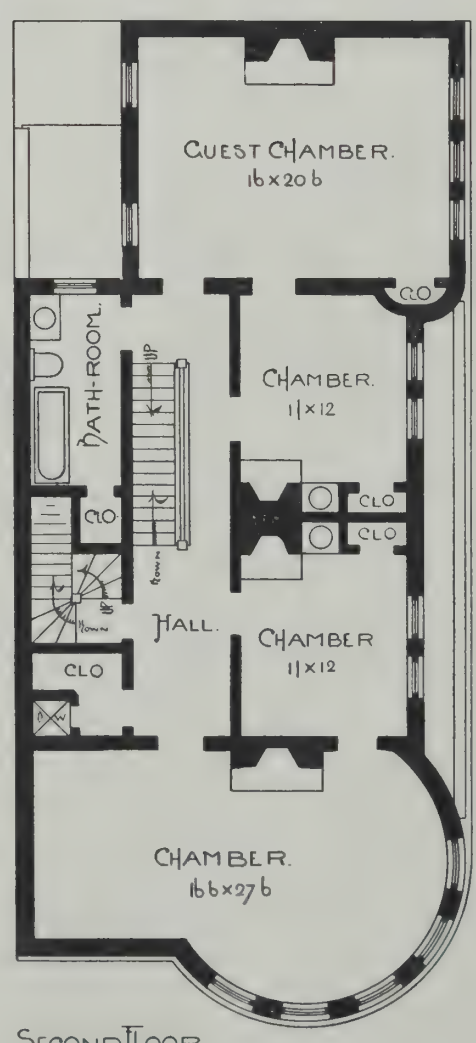
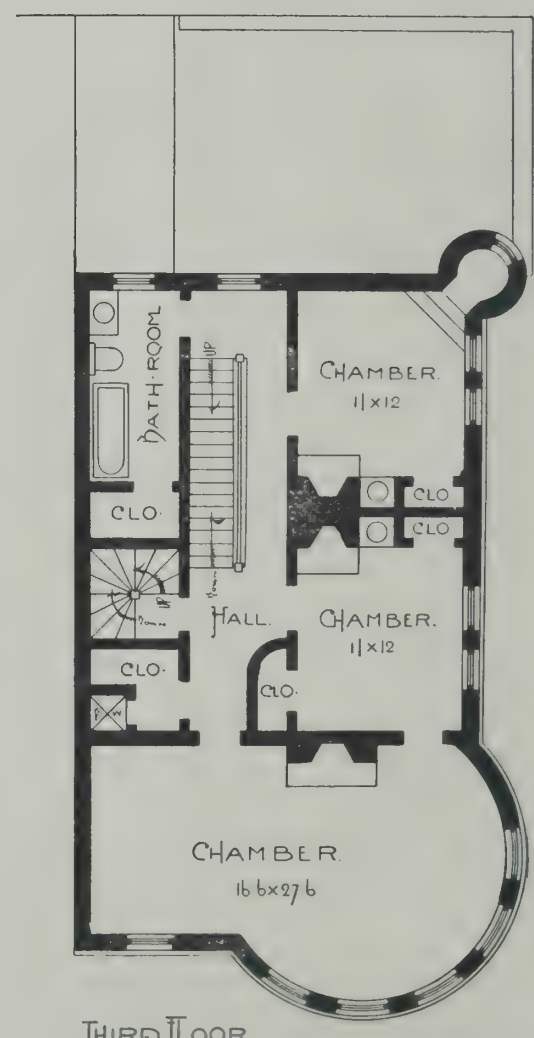


SECOND FLOOR.

A COLONIAL RESIDENCE AT STAMFORD, CONN.—See page 46.

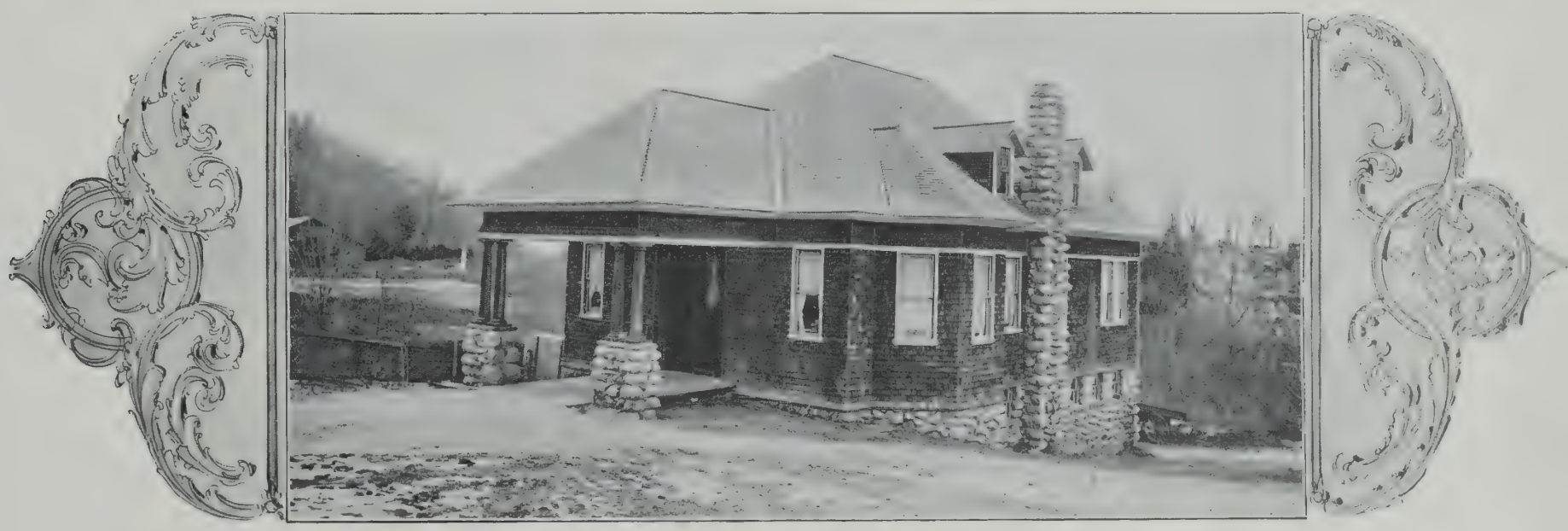


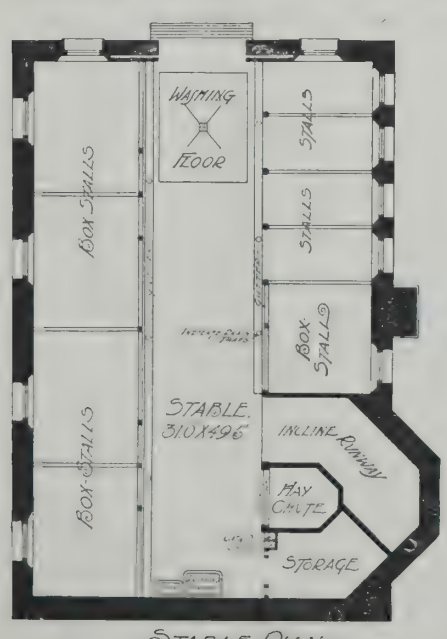




SOME TOWN HOUSES.—See page 35.

INTERIOR VIEW OF TOWN HOUSE.—See page 35.





STABLE PLAN.

FLOOR PLAN.

A STABLE AT PORT HENRY, N. Y.—See page 46.

A COLONIAL RESIDENCE AT STAMFORD, CONN.

The engravings presented herewith, on pages 33, 42, and 43, illustrate a residence erected for the Rev. Dr. R. P. H. Vail, at Stamford, Conn. The illustrations show a pure example of classic Colonial architecture, and the whole design is treated in a thorough, substantial and artistic manner. The features are the several well shaded porches, chimneys, bay and dormer windows. The underpinning is built of rock-faced bluestone. The exterior framework is sheathed, covered with paper, and then clapboarded. It is painted a delicate shade of Colonial yellow, with white trimmings. The blinds are painted cream yellow. The roof is shingled and left to weather finish. Dimensions: Front, 66 ft. 6 in.; side, 53 ft. 6 in., not including piazza. Height of ceilings: Cellar, 8 ft.; first story, 10 ft.; second, 9 ft.; third, 8 ft. The vestibule is wainscoted and paved with Italian marble. The main hall, extending through the entire building, is divided by a latticed screen, composed of windows and door, glazed in an ornamental manner. The woodwork in hall is treated in china white. It has a paneled wainscoting, and it contains an ornamental staircase, with newel post formed of a cluster of spindle balusters, and rail of mahogany. This newel, balusters, steps, and risers are treated in china white, same as trim. The drawing-room is also treated in china white, and is finished in a thorough Colonial style. The walls are decorated with the design of sunbursts and the horn of plenty. The fireplace is faced with Numidian marble, exquisitely veined, and it is provided with an elegantly carved mantel, made f om special design. There are arches on either side of fireplace; one forms the lobby, and the other is fitted up with a bric-à-brac cabinet with glass doors. The library is decorated in red and green. The walls are treated in a very deep red, while the woodwork is painted a very dark bottle green. The effect, and the whole treatment are most excellent. The fireplace is placed in the nook, separated by an archway, and is furnished with Numidian marble facings, and a mantel to match trim. This library also contains bookcases and desk built in. The study is trimmed with cherry, and it is furnished with bookcases and fireplace, the latter provided with tiled trimmings and a carved mantel. The windows open out on piazza. Dining-room is trimmed with dark red mahogany. It has a paneled wainscoting, ceiling beams, and fireplace with Numidian marble facings and hearth, and a mantel with columns, carved in an exquisite manner. The buffet, built in bay window, is the principal feature. It is provided with cupboards and drawers. The columns extend from counter to ceiling, and the whole is elegantly carved. The windows, over, are glazed with delicate tinted glass, shedding a soft and pleasant light over the whole apartment. Kitchen, laundry, and pantries are trimmed with whitewood, finished natural. These apartments are furnished with the usual fixtures complete. The second floor is treated in china white throughout, and it contains five bedrooms, large closets, and bathroom. The fireplaces are fitted up with tile trimmings and carved mantels. The bathroom is wainscoted and furnished replete. The third floor is treated similar, and it contains five bedrooms, bathroom, and a large open hall. Cemented cellar contains furnace and other apartments. Mr. William A. Potter, architect, New York City, N. Y.

Our engravings were made direct from photographs of the building, taken specially for the Scientific American.

A RESIDENCE AT GLENWOOD-ON-HUDSON, N. Y.

We present, on pages 36 and 37, plans, taken from working drawings, and perspectives, reproduced from photographs specially taken for the Scientific American, of a residence which has been recently completed for J. E. Andrew, Esq., at Glenwood-on-Hudson, N. Y. The building, as now completed, is one of the finest examples of domestic architecture in the vicinity of New York, and the aim of the architect has been to show by constructional outlines the general character of the building, to avoid all unnecessary ornamentation, and to have it show up on its face an appropriate and quiet tone. The exterior walls are built of local granite, of a bluish gray color, and trimmings of Kibby stone, of a reddish-brown hue. This stonework is cut with great care in a most exquisite manner, and the whole tone of coloring is most excellent. The roof is covered with red tiles. Dimensions: Front, 87 ft.; side, 91 ft., exclusive of piazza and porte-cochère. Height of ceilings: Cellar, 8 ft.; first story, 12 ft.; second, 10 ft.; third, 9 ft.; fourth, 8 ft. The main hall, 20 x 63 ft., and 12 ft. in height, is treated in the Old English style, and is trimmed with quartered oak. The walls have paneled wainscotings, and the ceiling is heavily beamed, forming deep panels. After one short run, the broad, low staircase runs up to second landing, which is spacious enough to form a balcony. The newel posts extend to ceiling, and between these posts are placed brackets, forming circular arches. The columns at the opposite end of hall have similar brackets. The vestibule has a floor laid in mosaic, and walls and ceiling are of quartered oak. The nook is provided with paneled seats, and an open fireplace built of brick, and furnished with Numidian marble hearth and facings, and a massive oak mantel. The drawing-room is treated in the pure classic Colonial style, with white and gold. It has an open fireplace, with facings and hearth of Numidian marble, and a mantel, with mirror, and columns extending to ceiling, and carved in an exquisite manner. Library is trimmed with red birch, and it has wainscot and ribbed ceiling. Bookcases and paneled divans are built in. Fireplace is trimmed with tiles, and is fitted up with a carved mantel, with columns. Office is trimmed with butternut, and is a convenience. Toilet and coat rooms are located under staircase. Dining-room is treated in the Baronial style, and is trimmed with old English oak. It has a paneled wainscoting, and a massive beamed ceiling. The buffet is built in, and also the mantel, both of which are carved in an elegant style. The fireplace is furnished with facings and hearths of Numidian marble. The doors on this floor are paneled geometrically, and these panels are filled in with carved work. The elevator lift runs from cellar to fourth story. Butler's pantry and rear hall and stairway are fitted up replete. The second floor is finished in the Colonial style, and it is treated with colors in a delicate manner. The guest chamber is finished in white and gold. This floor contains five bedrooms, dressing-room, two bathrooms, and many large closets. Bathrooms are wainscoted with white English tiling, and the floors are laid in mosaic. The furnishings are of the best improved kind, with exposed plumbing, all nickelplated. The third floor is trimmed with cherry, and it contains four bedrooms, servants' rooms, bathr om, and billiard room. The fourth story contains ample storage. The cellar contains kitchen, laundry, pantries, cold storage, furnace room, and other necessary apartments. Mr. R. H. Robertson, architect, 160 Fifth Avenue, New York.

AN ENGLISH COTTAGE.

We present on page 41, as one of the illustrations, a dwelling recently erected for Mr. William Lumas, at South Orange N. J. The design is treated in the English, half-timbered style with good effect. The underpinning is built of stone, with a coating of cement on the outside wall. The exterior woodwork above is covered with cedar shingles at first story, and painted Indian red. Second and third stories are beamed, forming panels which are filled in with plaster work, while the beams and trimmings are painted a darker red. The roof is shingled and painted red. Dimensions: Front, 47 ft.; side, 30 ft. 6 in., exclusive of piazza. Height of ceilings: Cellar, 7 ft; first story, 9 ft. 6 in.; second, 9 ft.; third, 8 ft. 6 in. The interior throughout is trimmed with whitewood, and the principal rooms are stained and finished in mahogany. The hall is a spacious apartment, with a vista through the entire length, and an ornamental staircase, with carved newel posts, and an alcove, forming an entrance to kitchen, are the good features; this alcove contains an open fireplace built of brick, with hearth and facings of same. Parlor and dining-room are spacious and well-lighted rooms, and each have paneled divans and open fireplaces trimmed with tiled hearths and facings, and hardwood mantels made from special designs. Kitchen and pantries are trimmed and wainscoted with yellow pine, finished natural, and they are furnished with all the latest improvements; hardwood floors. Second floor is treated in colors; it contains four bedrooms, closets and bath, the latter containing all the best conveniences, with nickelplated exposed plumbing, and the walls are wainscoted with oak. Two bedrooms and ample storage on third floor. Cemented cellar contains furnace and other necessary apartments. Cost $5,800, including furnace and everything complete. Messrs. Renwick, Aspinwall & Renwick, and W. L. Coulter, architects, 367 Fifth Avenue, New York.

Our engraving was made direct from photograph of the building, taken specially for the Scientific American.

STABLE AT PORT HENRY, N. Y.

We illustrate on page 45 the stable and carriage house of the Hon. Wallace T. Foote, Jr., at Port Henry, N. Y. The design shows most picturesque treatment for a stable on a side hill, the underpinning and chimney being of rough selected stones laid up at random, with considerable projection beyond the mortar joints; the exterior framework is sheathed diagonally with matched spruce boards, covered with felt paper and shingles, previously dipped in stain; two stone piers with double columns of good proportion support the hipped-roof entrance feature; the main roof is hipped and relieved by dormers. The stable plan shows nine stalls, five being box of regulation size; the floor is concreted, wooden slabs being placed in stall, which are all drained to gutter. The hay and feed chutes run through to loft. The incline runway leads to carriage floor above, which shows a harness-room with cases provided with glazed doors, range, and toilet. The flooring is of yellow pine, being carefully graded and calked at wash. The walls, as well as ceiling (paneled), are of yellow pine, which is also the finish throughout; doors and stairs, white pine. The loft has man's room finished off, and good hay and feed storage space, the bins being provided with sliding valves in stable; hay fork with trucks, hanging rods, etc., runs under the ridge and extends to projecting roof of gable at rear of building. A unique feature of the building is the availability of the carriage house for entertainment purposes, merely necessitating the removal of the carriages to the floor below, as the finish is neat, and all work throughout of the best. Dimensions: Front, 35 ft.; side, 53 ft. 6 in. Height: Stable story, 9 ft. 7 in.; carriage house, 12 ft. 3 in.; height from loft floor to top of hip, 18 ft. Cost, about $5,000. Harry C. Pelton, Esq., architect, No. 1 Madison Avenue, New York City.

Our engraving was made direct from a photograph of the building, taken specially for the Scientific American.

THE METROPOLITAN CLUB.

We illustrate on page 47 the Metropolitan Club, on upper Fifth Avenue, New York. The club was organized by a number of men on the waiting list of the Union Club, and other gentlemen, who thought it best to provide a club of equal importance, and in the now social centre of the town, and it is these gentlemen who have the honor of being instrumental in setting in motion the machinery which has been the means of materializing the largest, most imposing and luxurious of the club houses in New York. The projectors naturally looked for men of wealth to stand at the back of their scheme, and it was owing to the number of millionaires at the head of the list of members that the name "Millionaires' Club" was derived. This, fortunately, is a mistaken idea, because there are many men of modest fortunes who are members of this club, and it might be well to add that any club composed of millionaires entirely would be anything but interesting. The design is treated in the pure Renaissance. It is what might be called severely plain, but is in keeping with the chaste style of architecture of which the exterior is treated. The most pronounced feature of the building is the unusual dimensions, and the white marble of which it is built, and the only bit of ornamentation is the carved frieze and cornice, and the colonnaded entrance at the street side, which gives relief to its simplicity. Upon entrée to the building the whole tout ensemble gives an impression of luxuriousness regardless of expense and above any attempt, and it is owing to this that so much is detracted from the artistic point sought by the architect. The treatment predominant throughout the interior is the Rococo style, exquisitely rendered, and a most excellent success. The grand, stately hall, with its length and breadth, and its lofty height, with its walls of polished marble, and the coppered ceiling incrusted with gold, gives an impression of coldness and severity in feeling in comparison with the other apartments. The grand, double staircase rising to gallery is also built of marble, and the latter is treated with an Ionic colonnade of polished marble. The principal apartments in addition to the great hall are the lounging room on first floor, the library on second floor, and the dining-room on top floor. In all of these apartments there is a profusion of decoration beyond anything attempted on this side of the water. The lounging room is one of the most gorgeous apartments, but rich and harmonious in tone, while the library is equally as elegant, although not distinct from the purpose for which it was intended. The main dining-room is furnished in the same splendor, while the ladies' and private dining-rooms are treated in the Colonial style, quite in contrast with the former. The state apartments and all other accessories belonging to a well appointed club are of the best description, and are in keeping with the surrounding elegance of the club and the whole scheme of treatment. Messrs. McKim, Mead & White, architects, Mohawk Building, Fifth Avenue, New York.

Our engraving was made direct from a photograph of the building, taken specially for the Scientific American.

Staining in Wood Black.

A process that is much employed for the above purpose consists in painting the wood consecutively with copper sulphate solution (1 per cent.) and alcoholic aniline acetate (equal parts of alcohol and acetate). A very durable black—and the nearest approach to real ebony—is readily obtained by moistening the surface of the wood with dilute sulphuric acid (1 :20), and subsequently applying heat. A temperature of 60°—90° C. suffices in a very few minutes to produce the desired result. An excellent black was obtained in this way on beach, bass, and box wood; while a second treatment with acid was necessary in the case of cherry, walnut, and birch. With oak and ash the results were not so good; and apple, and different varieties of pine, were still less amenable to the process, pine especially being unevenly stained. In order to afterward remove the acid from the wood, it might be well to thoroughly wash the latter with dilute soda solution, followed by clean water. It is unlikely that this method can be applied to any but small articles, because of the risk of possible fractures during the necessary heating of the wood.—*Badische Gewerbe-Zeitung.*

One effect of the recent earthquake in Cincinnati and the surrounding country is just coming to light. Notwithstanding the recent heavy rains, it has been discovered that many cisterns are still as empty as during the long dry spell. Investigation shows that the cement was cracked in hundreds of cisterns, rendering them practically worthless.

Large Prizes for Architects.

When there was so much agitation a few years ago concerning the erection of a new municipal building for New York City, a commission was appointed with a view to forwarding this work, and procuring the best possible plans.

The Municipal Building Commission was created by an act of Legislature in 1893 to supervise and take charge of the erection of a new municipal building in the City Hall Park. It was composed of the members of the Sinking Fund Commission, together with the Surrogate, the County Clerk and the Register. Plans were advertised for, in response to which 134 architects from all parts of the country sent in plans At the next session of the Legislature the law was repealed, and the Commission was left in existence with 134 plans on its hands and power to do nothing. All the plans were sent in anonymously, and no one knew to whom they belonged. Finally the architects began to demand the return of their plans, and last year a bill was passed authorizing the Commission to open the plans, select the best six, and award the $17,000 offered in prizes. The Commission immediately selected a committee of architects to select the six. This was composed of Napoleon Le Brun, the late Richard M. Hunt, and Stanford White, who received $1,500 each for their work. The six plans selected were then turned over to the Commission to select one as the best of the lot, and the others were returned to their owners. This selection has just been made, and the result announced. The Commission awarded the first prize of $7,000 to J. R. Thomas, of 160 Broadway, New York, and the five $2,000 prizes were awarded to Edward P. Casey, 191 Broadway, New York; Rankin & Kellogg, 1,001 Chestnut Street Philadelphia; Gordon, Bragdon & Orchard, of Rochester; Ernest Flagg, 54 Broad Street, New York, and P. D. Weber, of Chicago, Ill.

This will probably be the last act of the Municipal Building Commission.

The Commission selected Mr. Thomas's plan as the best of all. It follows in a general way the lines of the Hotel de Ville in Paris, and Mr. Thomas's estimate of its cost was about $6,000,000. Mr. Thomas's latest work for the city was the Seventy-first Regiment Armory and Squadron A's Armory.

THE METROPOLITAN CLUB.—See page 46.

Electrical Hazard and How to Guard Against It.

The National Board of Fire Underwriters has prepared the following set of rules for the guidance of those introducing electric light installations:

1. Have your wiring done by responsible parties and make contract subject to the underwriters' rules. Cheap work and dangerous work usually go hand in hand.

2. Switch bases and cut-out blocks should be non-combustible (porcelain or glass).

3. Incandescent lamps get hot; therefore all inflammable material should be kept away from them. Many fires have been caused by inflammable goods being placed in contact with incandescent lamp globes and sockets.

4. The use of flexible cord should be restricted to straight pendent drops, and should not be used in show windows.

5. Wires should be supported on glass or porcelain, and never on wooded cleats; or else run in approved conduits.

6. Wires should not approach each other nearer than eight inches in arc, and two and one-half inches in incandescent lighting.

7. Wires should not come into contact with metal pipes.

8. Metal staples to fasten wires should not be used.

9. Wires should not come into contact with other substances than their designed insulating supports.

10. All joints and splices should be thoroughly soldered and carefully wrapped with tape.

11. Wires should always be protected with tubes of glass or porcelain where passing through walls, partitions, timbers, etc. Soft rubber tube is especially dangerous.

12. All combination fixtures, such as gas fixtures and electric lamps attached, should have approved insulating joints. The use of soft rubber or any material in such joints that will shrink or crack by variation of temperature is dangerous.

13. Electric gas lighting and electric lights on the same fixture always increase the hazard of fire and should accordingly be avoided.

14. An electric arc light gives off sparks and embers. All arc lamps in vicinity of inflammable material should have wire nets surrounding the gl be, and such spark arresters reaching from globe to body of lamp as will prevent the escape of sparks, melted copper and particles of carbon.

15. Arc light wires should never be concealed.

16. Current from street railway wires should never be used for lighting or power in any building, as it is extremely dangerous.

17. When possible the current should be shut off by a switch where the wires enter the building when the lights or power is not in use.

18. Remember that "resistance boxes," "regulators," "controllers," "rheostats," "reducers," and all such things are sources of heat and should be treated like stoves. Any resistance introduced in an electric circuit transforms electric energy into heat. Electric heaters are constructed on this principle. Do not use wooden cases for these stoves nor mount them on woodwork.

The Proper Warming of Churches.

Few things, to those who are not in perfect health, are more calculated to give rise to any malady to which they may have a tendency, than sitting in a chilly church after the sharp walk which the ineradicable tendency to starting late seems to impose on all churchgoers. Perhaps the worst error in warming churches is committed by those who put off the commencement of the process until Saturday night, or may be Sunday morning, and then fire up hard to get things ready for eleven o'clock. The windows are kept closed for fear of losing heat; the stagnant air, with which those who visit churches on the week day are so familiar, is warmed up for Sunday use, but the walls remain cold, and when service commences, hot and even burnt as the air may feel, there is no warmth in the building. Worshipers are thus subjected to the worst possible combination of surroundings—bad ventilation, foul atmosphere, draughts from internal currents, and the respiration of hot air while sitting in a building which is cold.

The problem is not how to warm the air alone, but how to warm the church itself. This is necessarily a slow process; it is doubly slow where, as is commonly the case, the attempt is made to use the same apparatus to warm the church as is employed for warming the incoming air. Unless, as in some cathedrals, stoves are placed actually within the church so that radiant heat is available, we doubt whether it is possible in cold weather to make a building fit for Sunday use without keeping up the fire all the week. This is not so much a matter of coals as of labor and supervision. A little fire all the week, with only just enough ventilation to keep the air sweet, will do far more to make the fabric warm than a great blaze for a few hours; and after all, what is wanted much more is to warm the fabric, so that every stick and stone shall radiate a sense of comfort.

When churches are too hot from overfiring, people catch cold in consequence of the draughts which are produced, and from the chill on coming out again. These are what one may call honest colds—stiff necks, neuralgias, lumbagos, and sometimes "cold in the head," —things they might catch anywhere from sitting in a draught, even of pure air. Unfortunately, too often the heat is the heat of closeness rather than of excess of fire, and then the results are much more deadly. Added to the evil of the draughts are the toxic effects of breathing again the breath of others, and absorbing the exhalations of their fellow worshipers. From such influences arise too often those depressing colds which, in fact, were till 1889 called "influenza colds," with streaming eyes and nose, feverishness, and depression, drifting sometimes into an almost superlative post-nasal catarrh, with great exhaustion.—*British Medical Journal.*

Preserving Wood.

A simple, effective and cheap way of preserving wood from decay is practiced in Switzerland, in the preparation of posts for the telegraph service. A square tank having a capacity of some 200 gallons, is supported at a height of 20 feet or 25 feet above the ground, by means of a light skeleton tower built of wood. A pipe drops from the bottom of the tank to within 30 inches from the ground, where it is connected with a cluster of flexible branches, each ending with a cap having an orifice in the centre. Each cap is clamped on to the larger end of a pole in such a manner that no liquid can escape from the pipe except by passing into the wood. The poles are arranged parallel with one another, sloping downwards, and troughs run under both ends to catch drippings. When all is ready, a solution of sulphate of copper, which has been prepared in the tank, is allowed to descend the pipe. The pressure produced by the fall is sufficient to drive the solution, gradually, of course, right through the poles from end to end. When the operation is ended and the post dried, the whole of the fibre of the wood remains permeated with the preserving chemical.—*Work.*

PARIS has three laws that have done more to dignify the effect of the city than has the genius of her architects as exemplified in separate buildings:

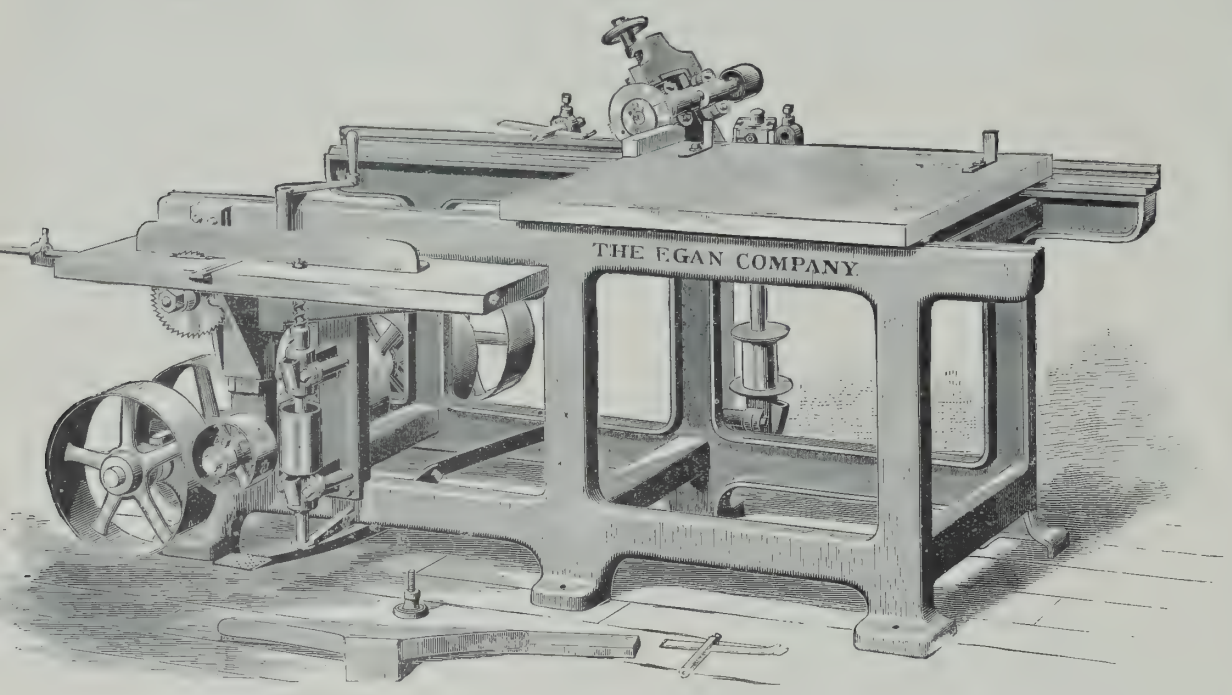
First.—There shall be no building erected of more than five stories above the ground floor.

Second.—The maximum height of the cornice shall be 65 ft. 8. in.

Third.—The main lines of façades, such as belts, cornices, large balconies, etc., on all buildings in the same block between streets shall be made to harmonize with each other, and in case the street grade is so steep that this is impracticable the buildings shall be designed in groups.

IMPROVED WOOD-WORKING MACHINERY.

The machine illustrated herewith is designed for finishing the edges of sash, for rabbeting, beading, and jointing the edges of blinds, for grooving and boring sash for the cords, and for the endless variety of finishing work of this kind in sash, door, and blind factories. It does the same work that heretofore required the use of three

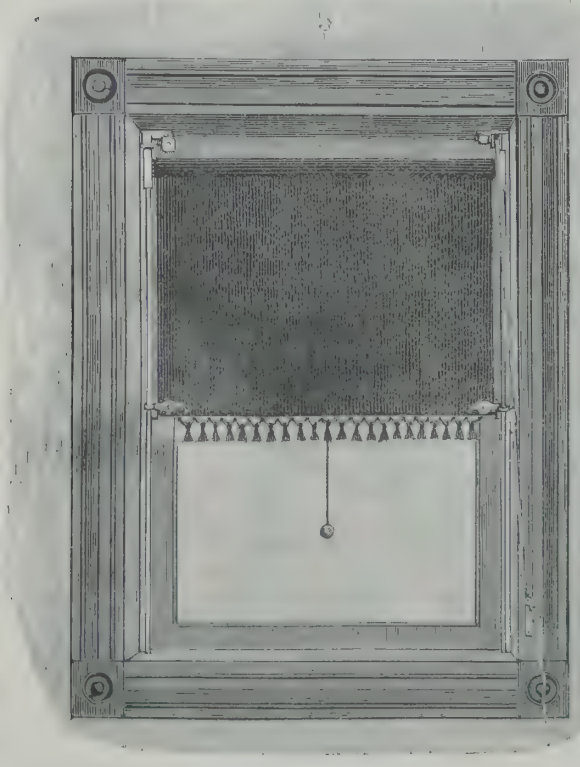


SASH FINISHING AND BLIND RABBETING, BEADING, AND JOINTING MACHINE.

machines. The frame is thoroughly braced and planed perfectly true, and has the countershaft connected at the base. The top of the frame is arranged for a sliding table, working in planed ways, and used with the jointing head in working sash; also for working blinds, when the three cutter heads are brought into operation at once by using an adjustable fence, and jointing, rabbeting, and beading cutters. The bed, adjustable on the frame, is provided with a saw mandrel for cutting all kinds of grooves, and a boring mandrel, operated by a treadle for boring the hole for the cord in the sash; the hole being bored and the groove cut without taking the sash from the table. The capacity of the machine is extraordinary, and makes it an invaluable tool for sash and blind work. The machine is manufactured by the Egan Company, 209 to 229 West Front Street, Cincinnati, Ohio.

THE BASSETT SHADE FIXTURE.

The illustration represents the application of an entirely new device in window shade fixture, affording an adjustable and self-locking window shade which has a double adjustment. With this improvement the shade can not only be unrolled to any point desired and securely locked at that point, but the whole shade, as thus unrolled, is capable of being itself adjusted vertically to shelter whatever portion of the total window space may be desired. A perfect window shade should be simple in its mechanism, it should possess few parts, it should be strong enough to withstand long usage without getting out of order, and lastly, and most important of all, the locking device should be thoroughly secure and



reliable. It is claimed that the device herewith illustrated fully meets these requirements, and that this is the first time that the problem of self-locking has been worked out from the right point of view. The improvement has been patented by Mr. F. H. Bassett, and is being manufactured and sold by the Holmes & Bassett Company, of Waterbury, Conn.

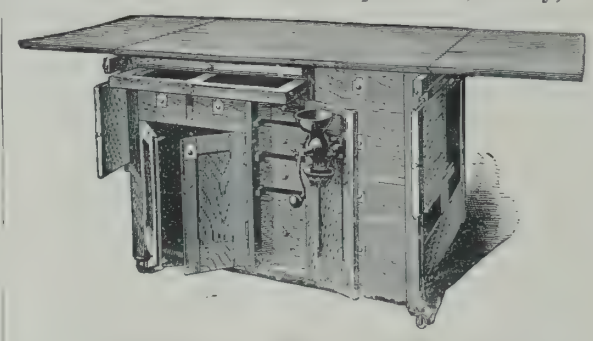
The improvement comprises a special form of the device for application to railroad and street cars, as well as the forms shown in our illustration, for application to the windows of private dwellings, offices, etc. The shade is provided with the customary coil spring on the roller, but the usual pawl and ratchet are wanting, and a couple of pivoted clutches or jaws are provided, one at each end of the shade rod, to engage and slide upon adjustable guide rods at each side of the shade. The shade roller, instead of being fastened on stationary brackets to the window frame, is hung upon two sleeves, which themselves slide upon the guide rods. The sleeves are held in position by two cords, which pass up and over two pulleys attached to the top of the window frame, one on each side, as shown in Fig. 5. The two cords unite in a single cord on the right hand side of the shade, and are secured on a suitable belaying pin. If it is desired to shade only the lower half of the window, the shade is pulled down to full length, the cord that holds the roller is released, and under the action of the coil spring the shade rolls down from above, winding up evenly and smoothly as it comes down, the roller sliding down upon the guides by means

of the sleeves above mentioned. To adjust the shade from the bottom, the clutches are released by pulling the cord from the window, and the blind is rolled up by means of the spring roller to the desired position, where it will stop by letting go the cord. Thus it will be seen that any space of the window may be shaded.

The Upholsterer says of this improvement: "The operation works with no apparent complications, and the parts are made with the utmost care to prevent breakage. We have examined every fixture that has been put upon the market for the last fifteen years; we know their disadvantages, and we can safely say that this fixture promises to fulfill in every way the needs for which it is made. It can be operated by any child, and will not fly up when suddenly released, but remains in the position last held. The device is simplicity itself, and can be put up by any one."

HARKINSON'S KITCHEN CABINET TABLE.

Famous culinarians from all parts of the civilized world use and commend this table. It brings together in the most systematic manner from every part of the kitchen, all the implements, cereals, flour, coffee, tea, chocolate, etc. A noted culinarian has called it "a perfect kitchen in itself," as it has so many distinct departments in it, and each department works independent and free from contact with the other, so much so that the entire table can be opened up in all its thirty-four distinct departments without one coming in contact with the other. It also divides the different implements used in the kitchen into two distinct departments, namely, the



HARKINSON'S KITCHEN CABINET TABLE.

large and the small implements. The table has partitions or boards for cutting bread, meat, etc., also a department for preserving and for canning all kinds of fruits. Orders for it come from all parts of the civilized world. Nothing has been forgotten in its make up, even down to a pulverizing coffee mill. It is manufactured of solid oak, and handsomely and elegantly finished. The office and salesroom of the Harkinson Kitchen Cabinet Company is located at 317 North Second Street, Philadelphia. A postal card will bring the reader any further needed information.

A Gun Cleaning and Lubricating Compound.

G. W. Cole & Co., 113 Broadway, New York, manufacture the "3 in 1" compound for guns, which it cleans and lubricates to positively prevent rust. It will not evaporate, gum, or harden. Gun locks, stocks, and barrels, inside and out, should be cleaned with "3 in 1," and then wiped thoroughly. Enough will remain on to prevent rust, and yet not come off on your hands or soil your clothing. It is used by wheelmen very extensively, and prevents sweat of the hands, water, and salt air from rusting the nickel and steel. It lubricates chain and bearings. Put it in the oiler, and use in bearings and on the chain.

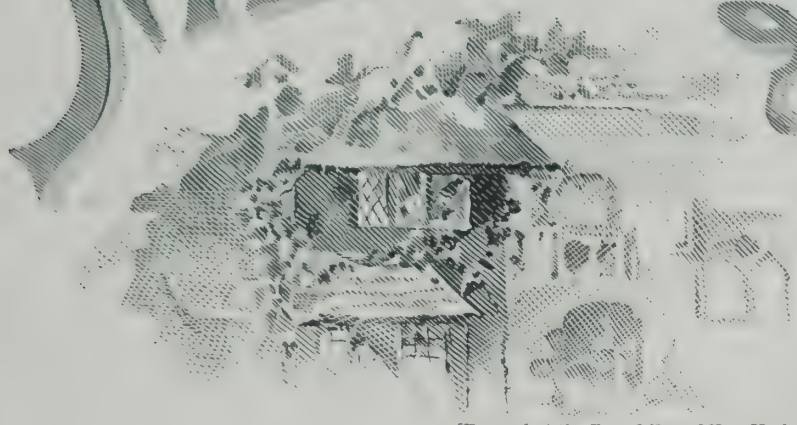
DRAPER'S ANEMOSCOPE.

The engraving herewith illustrates the practical usefulness of a very unique form of wind vane, known technically as an anemoscope. In this instrument, the weather vane is placed a few feet above the roof of a building, and connects by a vertical shaft to the room where the indicating arrow and dial are placed, either on the ceiling or on the wall. The dials are usually eighteen inches diameter, but are made larger if so ordered, for rooms of extraordinary dimensions. The dial is made of any desired wood, to harmonize with the trim of the room in which it is placed. The eight cardinal points are of brass, finished in nickel, which forms a very handsome contrast with the goldplated arrow oscillating on the polished surface of the dial. This anemoscope is a great addition to a dwelling or a yacht clubhouse. It is

DRAPER'S ANEMOSCOPE.

substantially constructed on simple scientific principles, and it is impossible to get out of order. The anemoscope is made by The Draper Manufacturing Company, 152 Front Street, New York, which also makes self-recording thermometers, barometers, rain gauges, tide gauges, and instruments for recording the velocity, direction, and force of the wind.

SCIENTIFIC AMERICAN.



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THE ORCHARD.—See page 51.

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THE

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THE NEW CUSTOM HOUSE FOR THE PORT OF NEW YORK.

In the erection of its new Custom House, and in the choice of a site that shall properly exhibit the proportions and beauty of the completed building, New York City has a great opportunity. The question of site and building should be considered in a broad and patriotic spirit; it should not be judged as a matter of simple commercial expediency. The city of New York is so truly representative of the great people and country which lie behind it, that any question like this, which involves the erection of a representative public building, has much more than a merely municipal interest. New York is the gateway in the East, as the Golden Gate is in the West. Nearly the whole of the intercourse between the Old World and the New is carried on by way of these two cities. This Republic has long been the cynosure of the peoples of the Eastern Hemisphere, and over and above the great army of immigrants who come to stay, there is a continual stream of visitors who come to study our ways of life, our industries, our art, our public works, and any and everything else that goes to make up our strong national individuality. "First impressions," whatever may be said to the contrary, are lasting, and the general estimate which these students of our country will ultimately carry away will be very largely determined by their first impressions in New York City.

Perhaps one of the peculiarities about New York which strike the visitor sooner than anything else is the almost entire absence of Government buildings. The one building in which New Yorkers take the greatest pride is the old City Hall. Commenced in 1804, of a pure style of architecture, it stands to-day as one of the most pleasing architectural productions of the city. The Court House, not only from its architectural defects, but because of the unsavory association connected with its origin at the time of the Tweed ring, has always been a thorn in the flesh. The only other building which may be mentioned in connection with this group is the Post Office. This is hardly a proud record for a city of the size and dignity of New York.

The building of a new Custom House, which is likely to be undertaken at an early date, affords an opportunity to provide a public building which may not occur again in this generation. No paltry spirit of false economy should prevent the most desirable site being selected for the Custom House. At present two alternative plans are under consideration: one of which contemplates the pulling down of the present Custom House, which stands on the corner of Wall Street and William Street, and the erection of the new building in its place; the other involving the sale of the present site, the purchase of the block which forms the southern boundary of Bowling Green, and the erection of the Custom House upon it, after all the existing buildings have been removed.

Now, to any one who is acquainted with the two sites, it will be evident that, for architectural or picturesque effect, the Wall Street site is about as bad as can be imagined, whereas that at Bowling Green is in every way admirable.

The present Custom House is situated in a hollow, at the intersection of Wall and William streets. This is one of the older parts of New York, and the streets are consequently both narrow and crooked. The present building, and any that might be erected to replace it, would be visible only on the William and Wall Street sides; on the other sides it would be shut in and dominated by the adjoining buildings. The streets are so narrow that it is impossible for a passer-by to obtain any comprehensive view of the various buildings; and in the present instance, to place the new Custom House anywhere in that locality, would be to condemn it as an architectural monument to practical oblivion.

The Bowling Green site, on the other hand, is quite unique in possessing everything one could ask in the way of commercial fitness and architectural and monumental effect.

It is a place teeming with historic associations. Here was located the celebrated Fort George of the Dutch occupation, with its primitive palisades, embankments, and heavy gates. As the city grew, and the Dutch Burgomaster was succeeded by the Royal English Governors, this section of the city became the scene of still greater importance. The royal chapel and the governor's mansion were located within the fort, which was no longer a mere place of refuge for the good Dutch settlers when in fear of an attack from the Indians or the hated New Englanders, but rather as a haven of safety for the Governor and his family against the overheated passions of the people after the attempted enforcement, perhaps, of some obnoxious law. It is a childhood dream that the good Dutch burger assembled on the Green to practice the gentle game of bowls in the earliest days; and no doubt such was the case. But the plot now known as Bowling Green was not set out officially as a public resort for bowls until nearly the middle of the last century. The Battery Park and Bowling Green were, until some fifty years ago, the fashionable part of the city, and the new Custom House, were it built on this site, would look out on one side on Battery Park, on the other on Bowling Green Park, and what more fitting terminus could be given to the greatest thoroughfare of the metropolis than to have a magnificent Federal structure at the foot of Broadway? With the northern elevation looking up Broadway, with the western façade looking out upon the Hudson River on one side, and the broad expanse of New York Harbor on the other, an opportunity is offered for architectural effect that few cities ever possess. So much for the sentimental side of the question, which, we regret to say, the Chamber of Commerce at a late meeting, at which this question was brought up, were disposed to make light of. There is a very practical reason, however, for moving to the new site. The expense and physical difficulties in the way of procuring temporary quarters for the Custom House, while the old building on Wall Street is being demolished and rebuilt, are alone sufficient to settle the question in favor of the other site. It is to be hoped that those who have the love of their city at heart will do what they can to prevent this great opportunity of embellishing the city from being lost.

A DOUBLE DWELLING AT MONTCLAIR, N. J.

We publish on page 60 one of the most unique designs for a double dwelling house, which has been erected for the Rev. George A. Hall, at Montclair, N. J. The elevations of the design, which are well broken, give it the appearance of a private residence, while the plans are arranged for two families, in a most excellent manner. The underpinning is built of rock-faced red sandstone, laid up at random. The exterior walls above are built of wood and covered with clapboards and shingles, and painted yellow olive, with bottle green trimmings. The roof is shingled and finished natural. The deck at rear is tinned. Dimensions: Front, 47 ft. 6 in.; side, 58 ft., not including porches. Height of ceilings: Cellar, 7 ft.; first story, 9 ft. 6 in.; second, 8 ft. 6 in.; third, 8 ft. The interior arrangement is most complete, and it is trimmed throughout with whitewood, finished natural. The doors and windows have neat moulded casings. The halls, with their broad, low staircases, with Ionic newel posts, and paneled divan, are quite in keeping with the latticed windows and the several spindle transoms, which carry out the antique effect so successfully sought. Parlors are provided with corner cabinets. Dining-rooms are furnished with open fireplaces, built of brick, and provided with tiled trimmings and hardwood mantels. The pantries are fitted up with drawers, dumbwaiter, and shelves, inclosed with glass doors. Kitchen is wainscoted with narrow beaded stuff, and fitted up replete. The second floor of each house contains library, three bedrooms, large closets, and bathroom, and the third floor contains three bedrooms and closet. The bathrooms are wainscoted, and provided with the usual fixtures. The cemented cellar contains furnace and other apartments. Cost, $7,900, complete. Mr. Effingham R. North, architect, Park street, Montclair, N. J.

Our engravings were made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.

MR. S. BING, the well-known expert in art matters, has recently reported to the Director of the French Beaux Arts on the present conditions of American art, and the outlook for its future development. The New York *Sun* gives the following extract from the report:

"We may say that already America has succeeded in imprinting on its business architecture the prevailing mark of the people which delights in enterprises, broad in scope, planned at the right moment, and boldly carried to their extreme consequences. Art has found a way to exert itself here no less than in its higher abstractions. It is precisely in considering the ultra-practical nature of business buildings, especially with a people still little accustomed to æsthetic matters, that we think, not without terror, of the barbarous creations that might have seen the light under such conditions. . . .

"Finally, to limit ourselves to the appearance of the city of New York, it will be admitted that the picture to be complete really needed to be dominated by the outline of these impressive masses. It seems, too, that there was need of nothing less than this supreme triumph of commercial power to make the great emporium of the oceans rise worthily above the level of the sea, to give the finishing touch to the most striking picture of human activity, spreading out the full amplitude of its proud lines on the vast horizon of an unequal background."

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TIGER INN CLUB.

We present in this issue, on pages 58 and 59, the "Tiger Inn Club," which has been recently erected at Princeton College, N. J. The evident intention of the architects has been to reproduce as near as possible an old English inn. It is designed in the half stone and timbered style of architecture of the Gothic order, and has many excellent features. The underpinning and the greater part of first story are built of rock-faced gray stone, laid up in a neat manner; the remainder of first, second and third stories are beamed, forming panels, which are filled in with plaster work. Roof shingled and painted red. Dimensions: Front, 75 ft.; side, 70 ft, not including piazza. Height of ceilings: Cellar, 7 ft. 6 in.; first story, 10 ft.; second, 9 ft.; third, 8 ft. 6 in. Vestibule is paneled. The main hall is trimmed with cypress, the walls and ceiling being paneled throughout, and stained and darkened to match old English oak. The nook, with paneled divan, is a pleasing feature, and the grand staircase, with broad landings and seat, is provided with newel posts, extending to ceiling, which form an arcaded effect. The large, open fireplace is built of brick, with hearth and facings of same, and is furnished with very handsome dog-irons and trimmings of wrought iron. There are some excellent bits of wrought-iron work in chandelier and bracket lights in hall. The windows throughout have transoms filled in with leaded glass. The floors are laid with oak, and are highly polished. Billiard-room is paneled with oak, and ceiling is heavily beamed. It is fitted up with several paneled divans, and an open fireplace trimmed same as the one already described. Ladies' parlor is treated with white and gold in a delicate manner. It has a nook with seats, a spindle transom, and an open fireplace with white enameled tiling, brass trimmings, and mantel of exquisite design. The graduates' dining-room is trimmed with mahogany, and it has seat and fireplace. The main dining-room is trimmed with oak, and is finished in oak green, with a cooling and refreshing effect. The walls are paneled and the ceiling is beamed. Butler's closet is fitted up complete, and the stairway leads to second floor and to basement, the latter containing kitchen, scullery, furnace, and all necessary apartments. The second floor contains four guests' bedrooms, three servants' bedrooms, linen closet, bathroom, and library. This floor is trimmed with whitewood and stained. Bathroom is wainscoted and paved with tiles, and is provided with porcelain fixtures and exposed plumbing. Third floor contains bedroom and ample storage. Messrs. Dehli & Chamberlin, architects, 874 Broadway, N. Y.

Our engravings were made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.

THE HOTEL MAJESTIC ENTRANCE.

We present herewith an illustration showing the main entrance of the Hotel Majestic, at Seventy-second Street and Central Park West. This entranceway is a marvel of beauty, and is treated in the Early Renaissance style of architecture. It is built of Indiana limestone, of a soft gray color. This stonework leaves nothing to be desired in color or texture, which is equally adapted to the minute delicacy of the exquisite carving which surrounds the entranceway and columns. The colonnaded effect, with square pilasters and columns supporting the balustrade, is well executed, and the whole scheme of treatment is well rendered.

VIEW OF ENTRANCE, HOTEL MAJESTIC.

"THE ORCHARD."

We present on pages 49 and 56 "The Orchard," the country home of Francis Wilson, Esq., which has been recently erected at Residence Park, New Rochelle, N. Y. The perspective views present one of the most attractive houses in the vicinity of New York, and the design is executed in a purely American style of architecture. The main lines of the building are square, but are sufficiently broken and ornamented to give it an artistic appearance. The underpinning, first story, and all stone work are built of Potsdam red sandstone, laid up with faces left rough as they come from the quarry. The terraces are built of similar stone. The superstructure is built of wood, with the exterior framework covered with shingles, and left to weather-finish a natural silver gray color. The woodwork and trimmings are painted bottle green. The roof is shingled and finished similar to main walls. Dimensions: Front, 48 ft. 8 in; side, 49 ft. 8 in., not including piazza and porte-cochère. Height of ceilings: Cellar, 7 ft. 6 in.; first story, 10 ft. 10 in.; second, 9 ft. 4 in.; third, 10 ft. 4 in. The main hall, running through the centre of the building, is trimmed with antique oak. It has a paneled wainscoting, and massive ceiling beams, and it contains a grand staircase, with carved newels, balusters and rail. The newel posts extend to ceiling and support an archway with excellent effect. The vestibule is paneled with oak and has a tiled floor. The toilet, in hall, is conveniently located. The drawing and music rooms are treated with ivory white and gold; the arcaded effect between is supported on columns, with carved capitals of the Corinthian order; the former having an open fireplace trimmed with Mexican onyx facings, tiled hearths and mantel of exquisite design. The library is trimmed with cherry and furnished with book-cases built in complete. The dining-room is very handsomely treated. It is trimmed with oak, and provided with a paneled wainscoting and ceiling beams, which form deep panels and ribs. The floors are laid with oak. The china cabinet and buffet are built in with leaded glass doors and rare bits of carving. The fireplace is built in, with hearth and facing of tiles and an elaborate carved mantel. The pantries, rear hall, and kitchen are trimmed and wainscoted with whitewood, finished natural, and are furnished with all the best modern fixtures complete. The second floor is trimmed with birdseye maple, with the exception of the front bedroom, which is furnished in the old Dutch style with ivory white. This floor contains a large open hall, five bedrooms, dressing-room, large closets and bathroom. The latter is paved and wainscoted with white English tiling, and is fitted up with exposed plumbing. The third floor contains a most unique theatre, elegantly fitted up with stage, boxes and a seating capacity of four hundred. There is, besides, on this floor and attic, two large chambers with bathroom, play room and two servants' bedrooms. Cemented cellar under the whole building contains furnace, laundry and other necessary apartments. Mr. G. Kramer Thompson, architect, Broadway, New York.

Our engraving was made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.

A MODERN COLONIAL DWELLING.

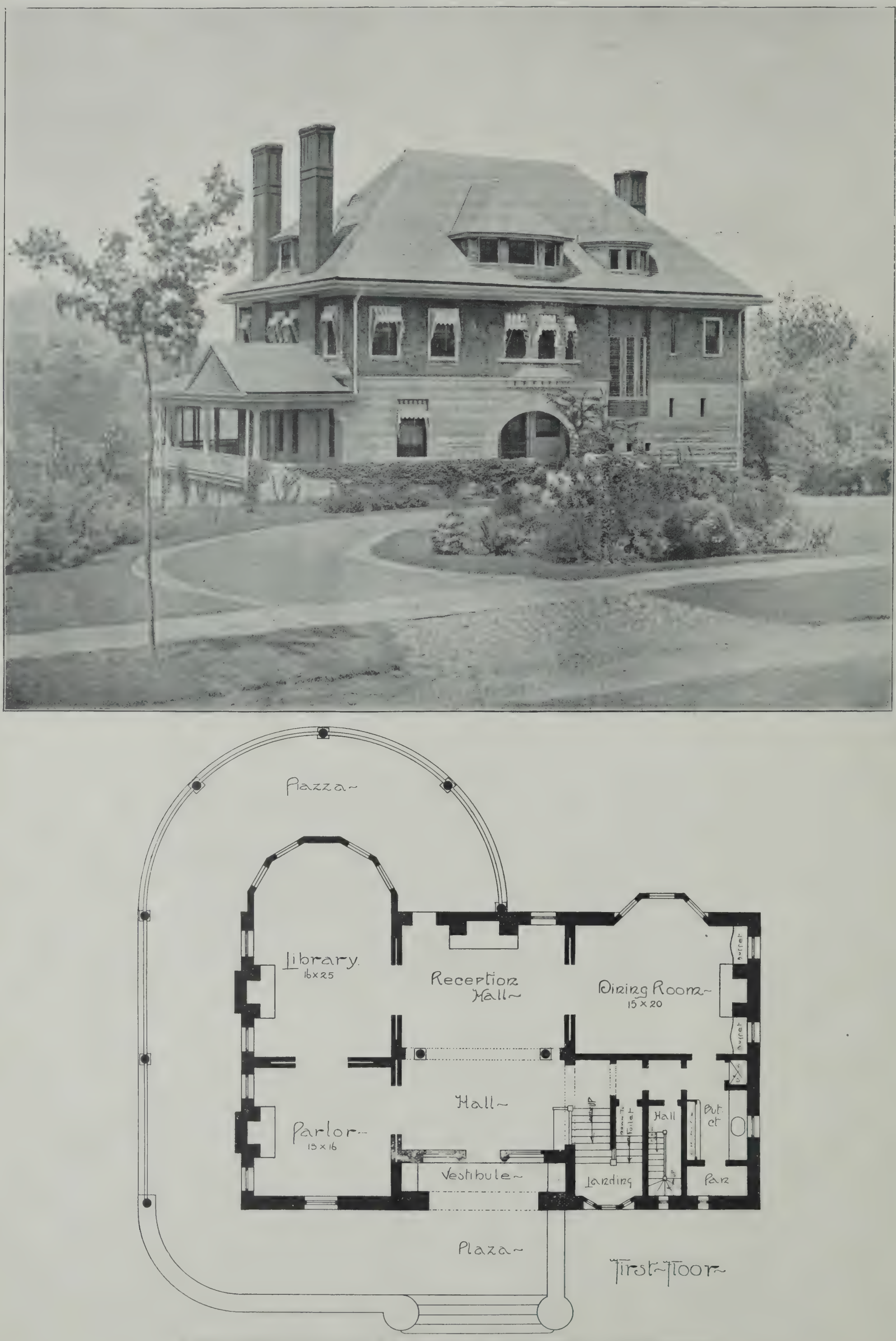
We present on page 55 in this issue a modern dwelling recently erected for the Misses M. E. Baldwin and L. L. Nelden, at South Orange, N. J. The design is treated in the modern Colonial style, with pure Colonial detail The building is constructed of the best materials in a thorough, workmanlike manner. The underpinning is built of local brick laid up in red mortar. The exterior framework is sheathed and papered, and then covered with clapboards on first story, and painted bottle green, with white trimmings; second and third stories are shingled. Roof is shingled also, and stained moss green. Dimensions: Front, 45 ft. 6 in.; side, 35 ft. 6 in., not including porches. Height of ceilings: Cellar, 7 ft.; first story, 9 ft.; second, 8 ft. 6 in.; third, 7 ft. 6 in. Hall, spacious, is trimmed with white pine, and treated in china white. It has a paneled wainscoting, divan, and a staircase with carved newel posts. Parlor is trimmed with similar pine, and is treated with ivory white, and it has an open fireplace, with tiled hearth and facings, and a mantel of exquisite design. There are book cases built in, on either side of fireplace, with leaded, stained-glass windows over same. Dining-room is trimmed with red cedar, and is fitted up in a handsome manner, with a tiled fireplace. The floors are of hardwood. Kitchen and pantries are wainscoted, and trimmed with white pine, finished natural, and furnished with all the best appliances complete. The second and third floors are trimmed with whitewood. There are four bedrooms, closets, and bathroom on second floor, and one bedroom and ample storage on third floor. Bathroom is wainscoted and fitted up with all the necessary fixtures, with exposed plumbing. Cemented cellar contains furnace and other necessary apartments. Cost, $5,000, complete. Messrs. Detwiller & Melendy, architects, Bennett Building, 97 Nassau Street, New York.

Our engraving was made direct from a photograph of the building, taken specially for the SCIENTIFIC AMERICAN.

MR. DANIEL WOOD writes to the *Builder* an interesting letter on the way in which the Ionic volute was drawn. It has been the fashion to suppose that all Greek curves were drawn freehand, by a sort of superhuman inspiration; but Mr. Wood says that nearly all Ionic capitals in Greece have a small hole in the centre of the eye of the volute, in which, as he thinks, was set the point of a cone. Around this cone was wound a string, to the end of which was tied a pencil, either directly or through the medium of a flat stick, through a hole in which the pencil was thrust; and, as the string unwound from the cone, the pencil described a volute. He says that with this arrangement he has followed exactly the curve of the volute of existing capitals, and that, as the hole for the point of the cone is found at Mycenæ, at Priene, and in the temple of Niké Apteros, at Athens, he thinks such an instrument was generally used. At Ephesus, the Ionic capitals do not show any arrangement for holding the cone, and he thinks it was probably held in a separate frame.—*American Architect and Building News.*

To remove a grease spot from wall paper, hold a piece of blotting paper over the spot with a hot flat-iron for a few minutes.

Woodwork and floors are now stained with a color called forest green. It harmonizes with draperies and coverings of almost any color.



A RESIDENCE AND STABLE AT MOUNTAIN STATION, N. J.—See page 62.

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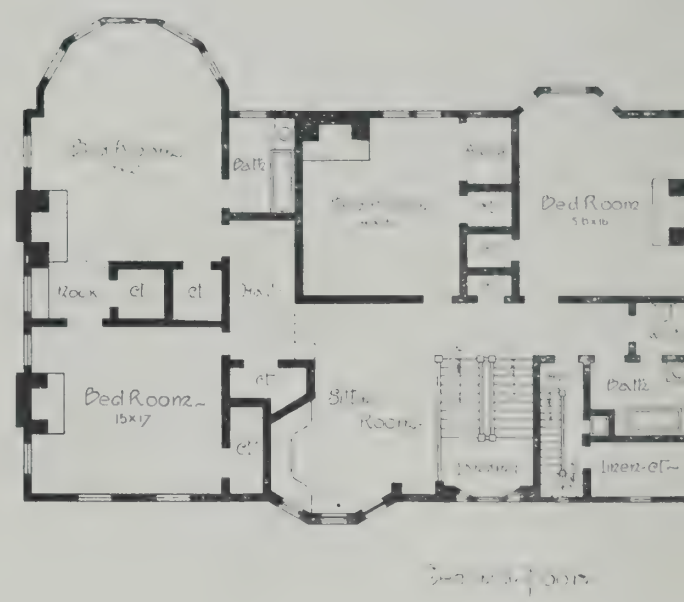
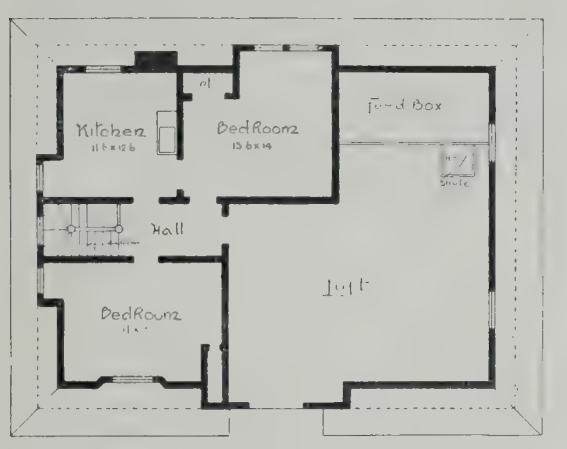
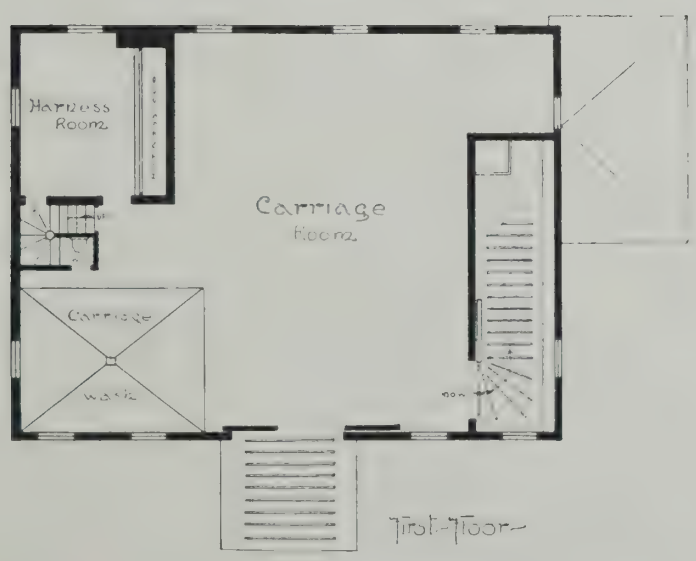
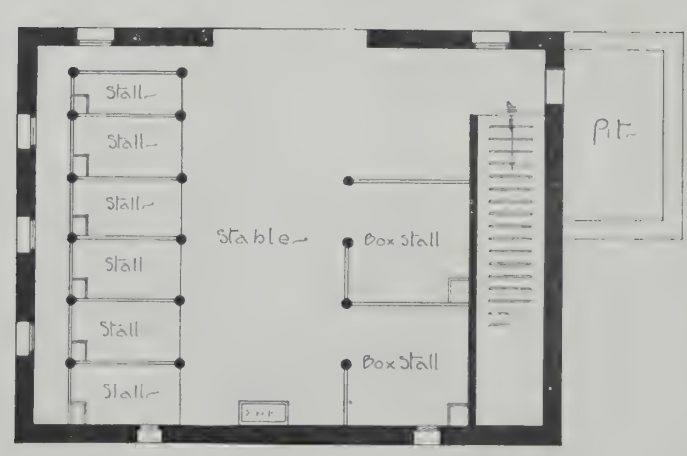




Second Floor



First Floor



Ground Floor

A RESIDENCE AND STABLE AT MOUNTAIN STATION, N. J.—See page 62.

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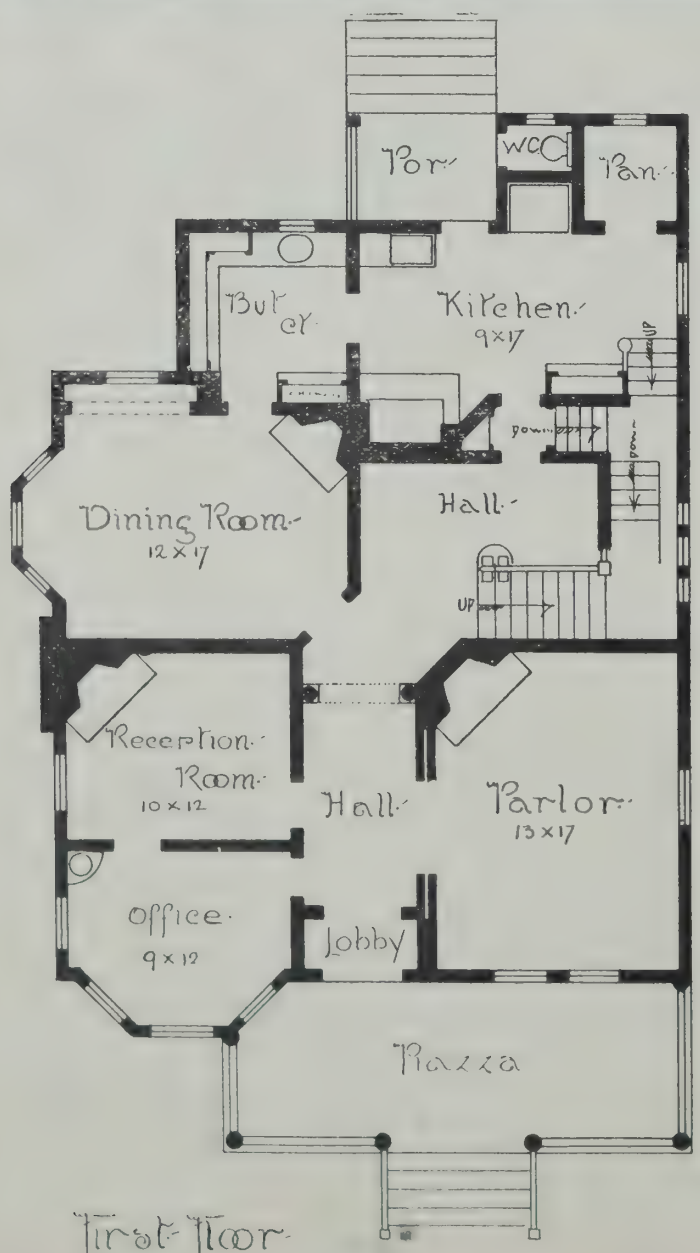

First Floor.

Second Floor.

A DWELLING AT NEW ROCHELLE, N. Y.—See page 62.

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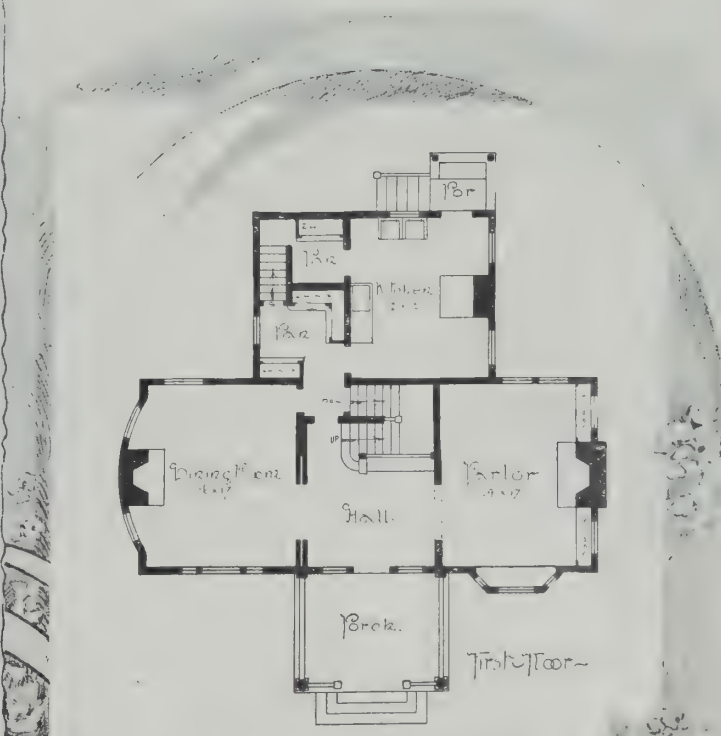
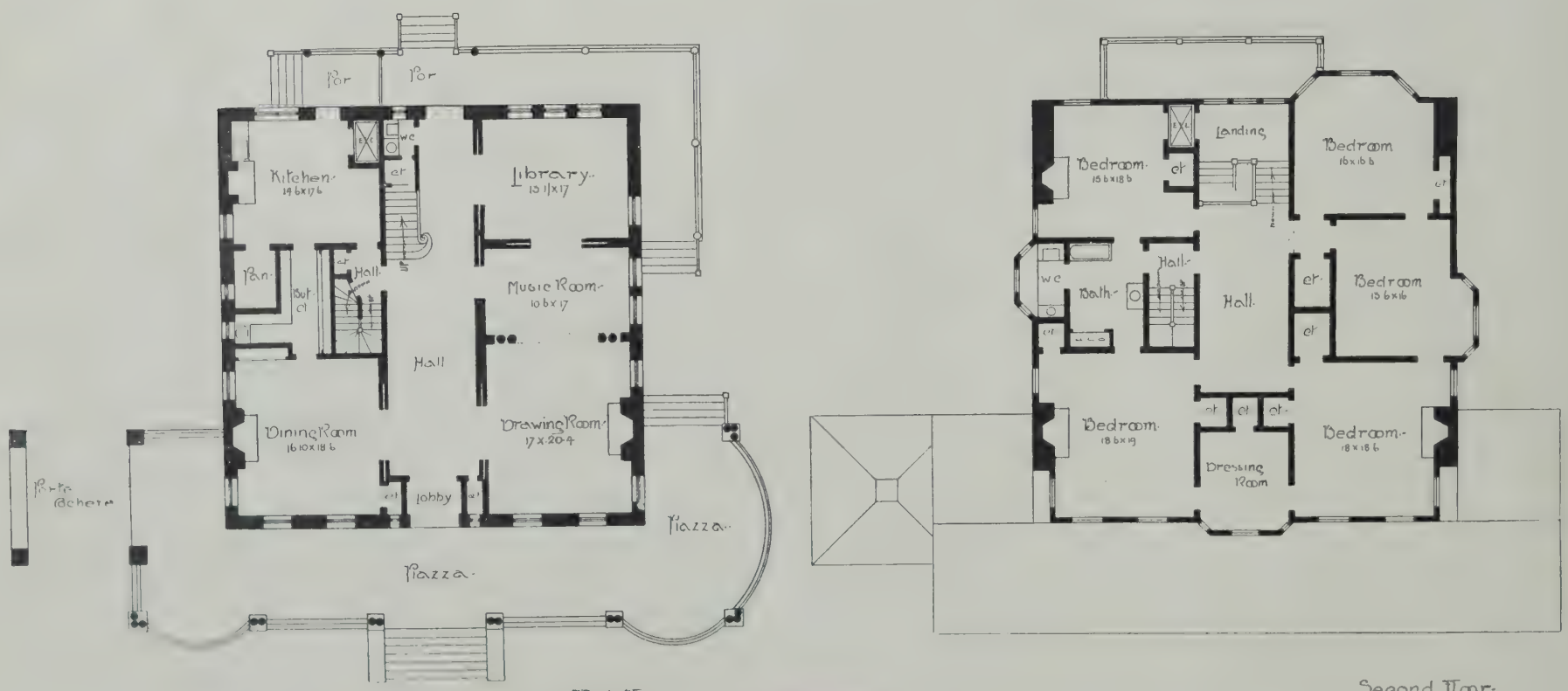
A MODEL DWELLING AT BRIDGEPORT, CONN.—See page 33.



A MODERN COLONIAL DWELLING AT SOUTH ORANGE, N. J.—See page 51.



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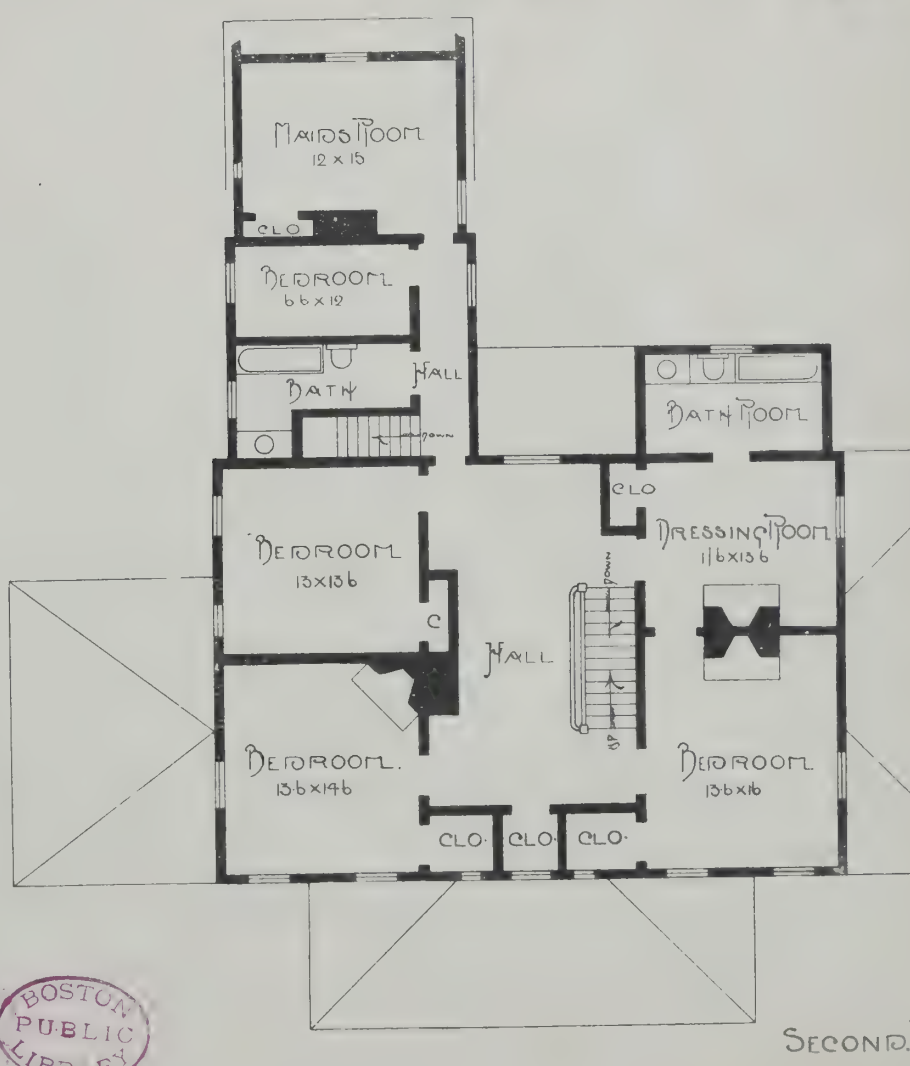
"THE ORCHARD."—See page 51.

FIRST. FLOOR.



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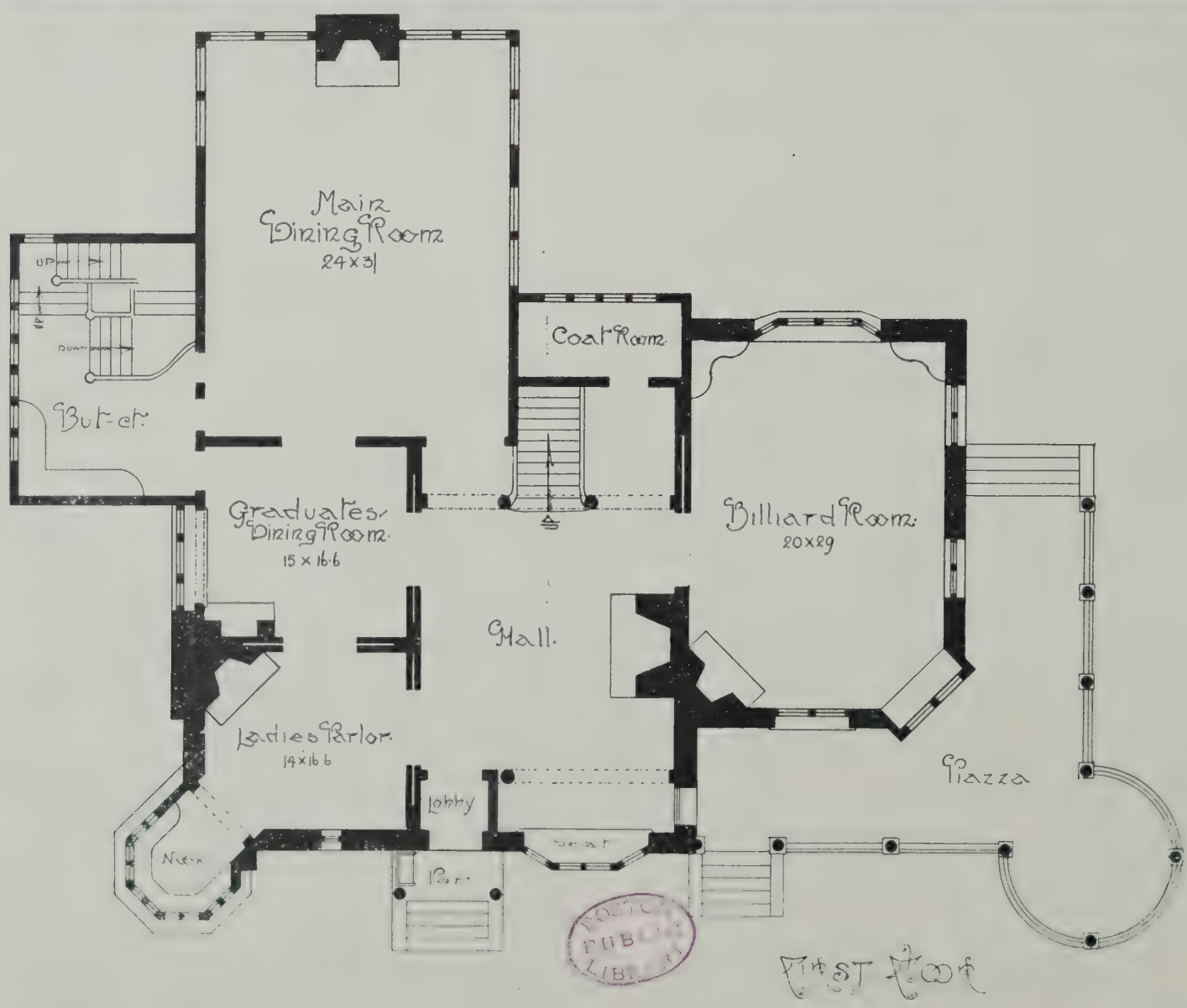
A COLONIAL RESIDENCE AT SOUTHAMPTON, L. I.—See page 62.



TIGER INN CLUB, PRINCETON COLLEGE, N. J.—See page 51.

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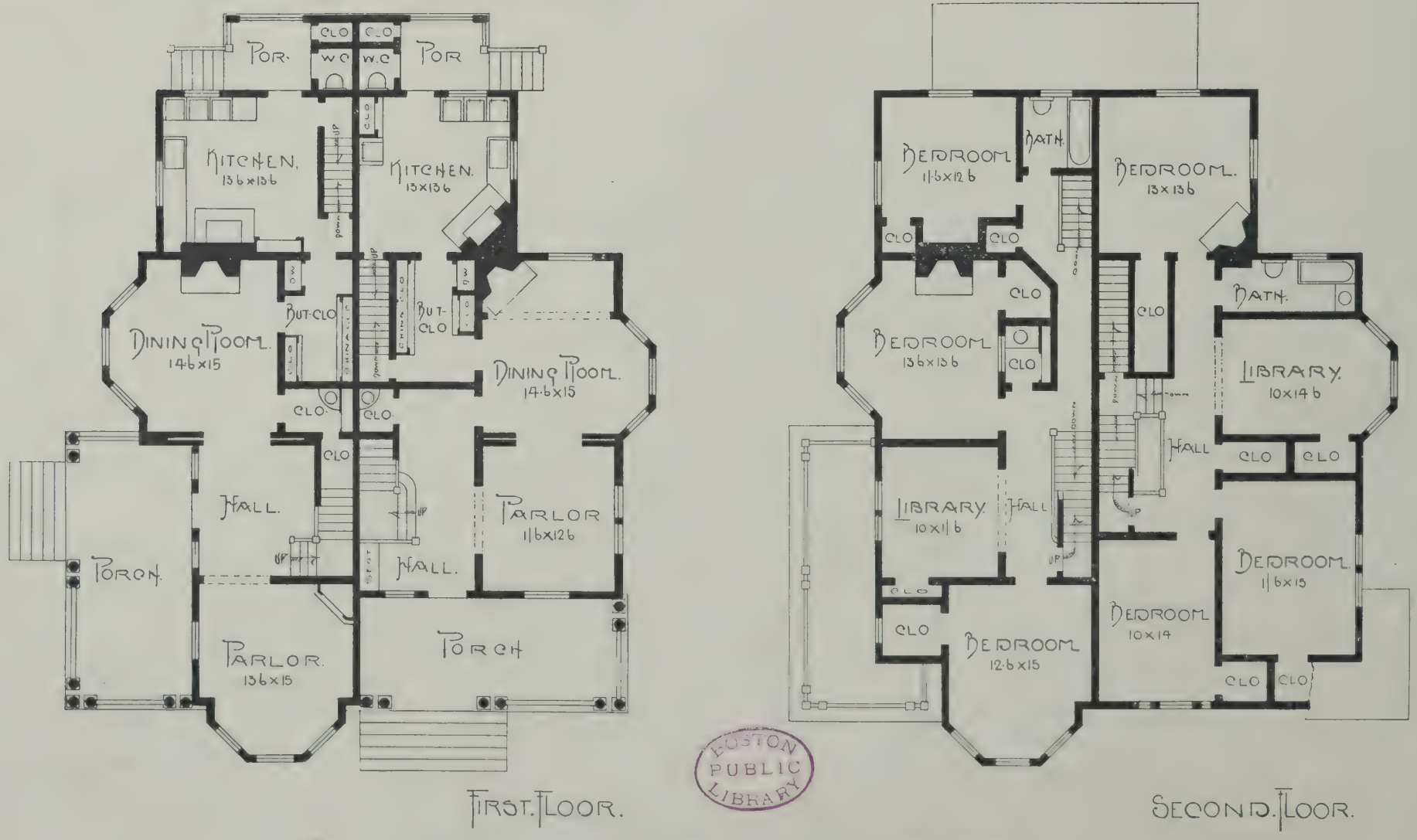
TIGER INN CLUB, PRINCETON COLLEGE, N. J.—See page 51.



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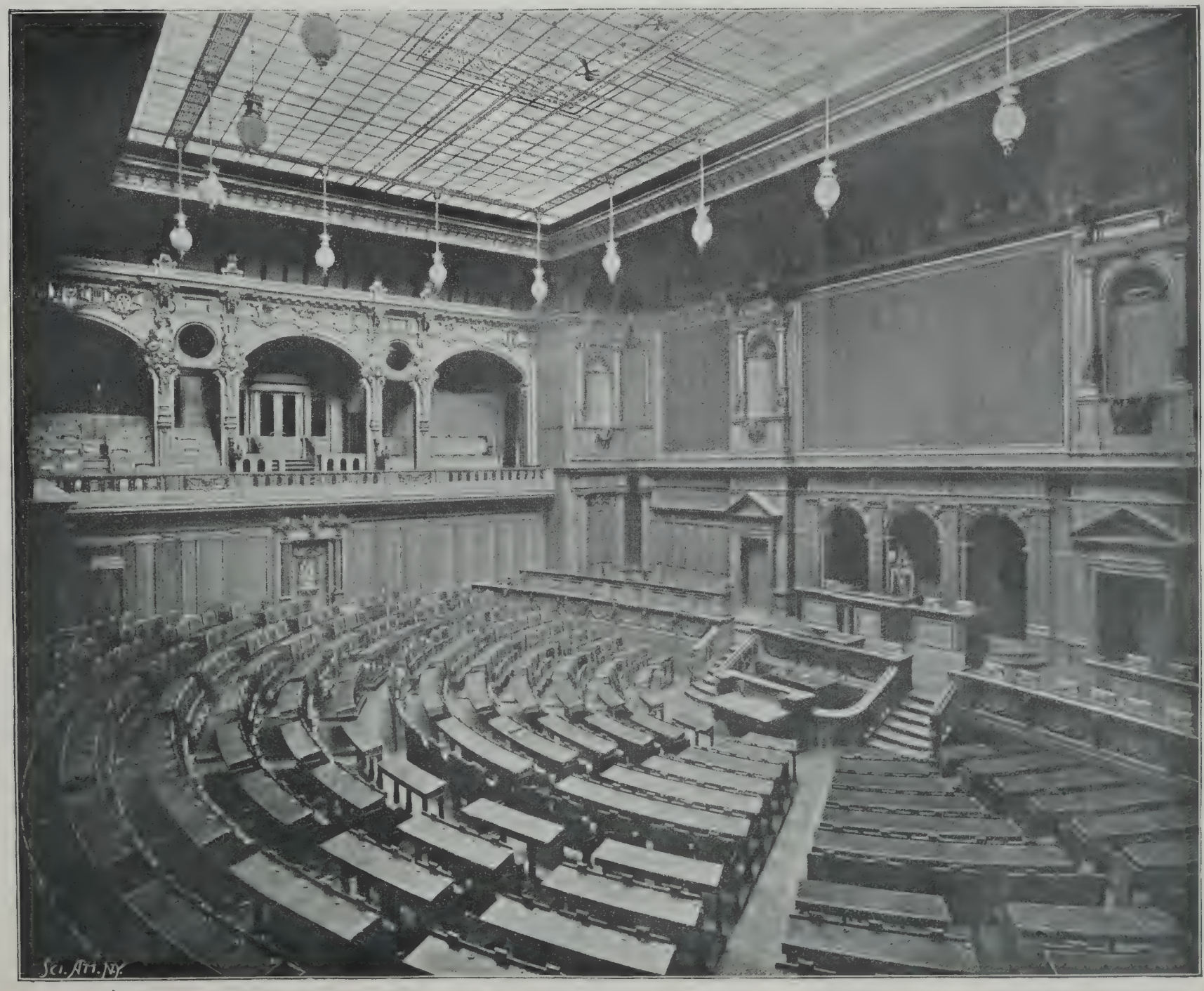
A DOUBLE DWELLING AT MONTCLAIR, N. J.—See page 50.

THE NEW REICHSTAG BUILDING, BERLIN.

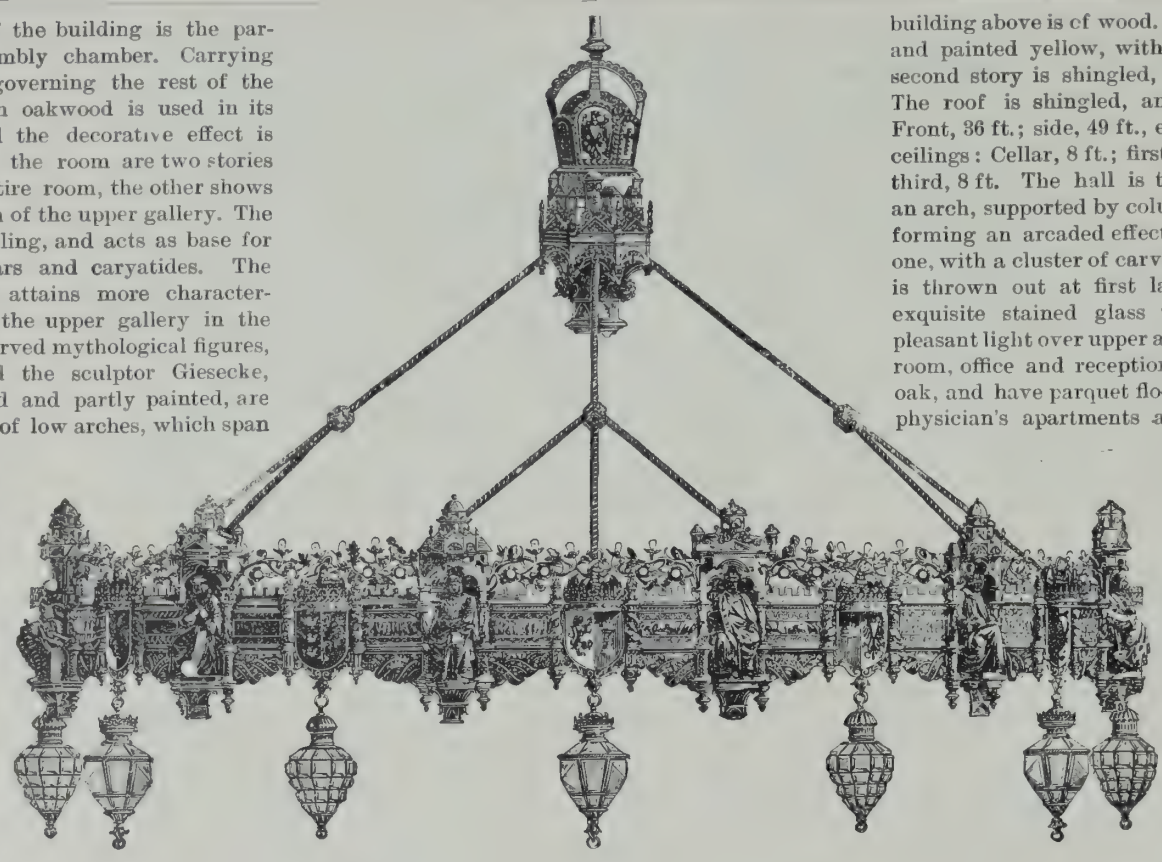
We have already illustrated the exterior of the new Reichstag Building, in Berlin, and the description of the structure accompanied the illustration. The article will be found in our SUPPLEMENT, No. 946. We present herewith some views of the interior features of the new Parliament Building, erected in Berlin, from the *Zeitschrift für Innen Dekoration*. We give an abstract from the somewhat lengthy article which appeared in the journal in question, describing the interior arrangements. The first assembly of the deputies elected from United Germany took place in the spring of 1871, in the imperial capital. The idea of giving to the newly established empire a great monument was so strongly felt, that in the autumn of the same year a commission was named to arrange the terms of an architectural competition. The result of this competition is known. The architect, L. Bolinstedt, of Gotha, was the winner in the contest. In working out the lines of the contest, it was impossible to remotely foresee the extent of the work, which for its parliamentary efficiency the Reichstag would have to do. This, and the unsuitability of the place then in question, are the reasons why neither the plan of the victorious architect nor that of any other was actually selected. It was decided in 1882 to hold a new competition, including German and German-Austrian architects. The opening of a wider horizon on the accomplishment of the affair brought about a spirited response from the architectural profession, and from their associates in both countries. Appended as signatures to the 189 designs submitted, the best and most famous names are found almost completely represented. Especially to be noticed appeared the plans of Prof. Frederick Tiersch, of Munich, and of the architect Paul Wallot, of Frankfort-on-the-Main. The sole and only reason why the design of the first named artist was not used lies in the fact that the arrangement of the rooms in the interior exceeded the necessity of the case. Of these two designs, both rewarded with the first prize, Paul Wallot's was eventually selected as best adapted for the building. Still, the plan developed to-day is far different from the original one. The changes were required by various conditions imposed upon the architect, involving the remodeling of his first plan. Of these changes little need be said here; it is enough to observe that the changes affected the Königsplatz front, in the placing farther back of the assembly room, with the consequent change of location of the great dome, which indicates exteriorly the position of the room in question. Finally, in the year 1884, building operations began, and the Reichstag building, after a ten years' period of construction, was given over to its proper uses, and on December 5, of the year 1894, was dedicated in presence of His Majesty the Emperor. The lobby, or foyer, is nearly 325 feet long, and by a central cupola is divided into three portions. From it the parliament room is directly entered. One of our cuts shows the great annular chandelier designed for the lobby or foyer. The restaurant in all its details is unusually complete, and one of the cuts shows the eastern wall, with tables and chairs. The portals, buffets, and panels are all in hardwood, cabinet finish, from a Munich atelier, and represent the highest German development of the joiner's and wood carver's arts. Wherever color was used on the walls it was applied with a view to having its proper effect brought out by the use of appropriately colored glass in the win-

EASTERN WALL OF THE RESTAURANT.



PARLIAMENT ROOM OF THE REICHSTAG.

dows. The principal room of the building is the parliament room, or great assembly chamber. Carrying out the æsthetic principles governing the rest of the building, light brown German oakwood is used in its decoration and finishing, and the decorative effect is unusually rich. The sides of the room are two stories high. One cut shows the entire room, the other shows some features of the decoration of the upper gallery. The lower division is in plain paneling, and acts as base for the upper story with its pillars and caryatides. The architectural effect in wood attains more characteristic and rich development in the upper gallery in the cut than elsewhere. Richly carved mythological figures, modeled by Prof. Vogel and the sculptor Giesecke, which figures are partly gilded and partly painted, are placed at the springing points of low arches, which span the space between them, and on these arches the vaulted roof or ceiling rests. Under the main cornice are the heraldic shields of the different German States and cities in correct coloring. The carved vaulting of the ceiling acts as the frame for a skylight, treated with comparative simplicity. In it color is only used in a frieze which runs around it, and on the imperial eagle carried on the central grille, which, poised over all, forms the centre of the skylight. The German nation has done itself honor in providing so rich material for the production of the Reichstag's Parliament House, and we can firmly believe that this building presents, in the art sense, the most remarkable example of its kind in the world.

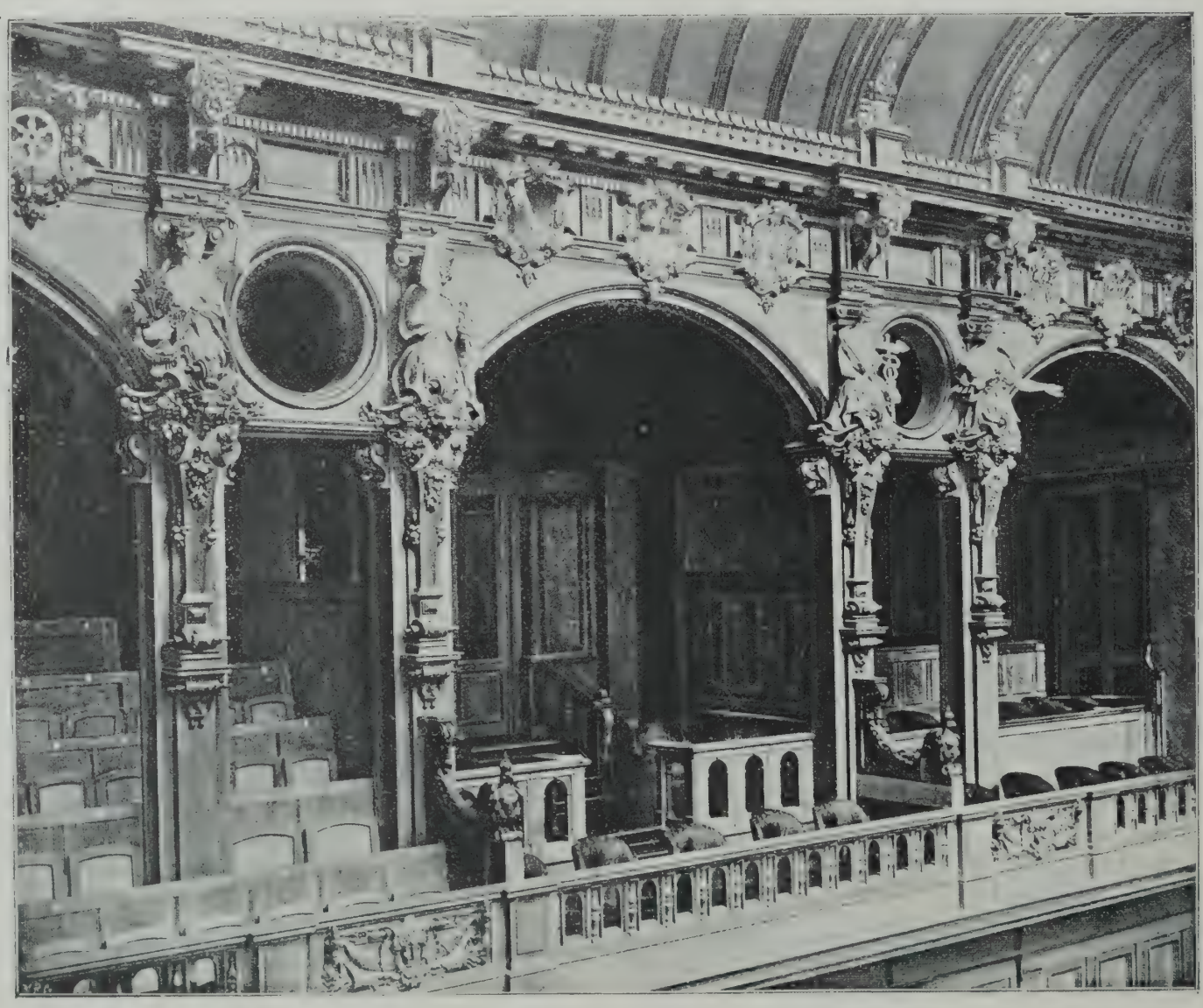


CIRCULAR CHANDELIER FOR THE LOBBY.

A COLONIAL RESIDENCE AT SOUTHAMPTON, LONG ISLAND.

We present herewith, on page 57, a residence recently completed for Edward Bell, Esq., at Southampton, Long Island. The design is purely Colonial in its treatment, and it has many pleasing features, including several well shaded porches. The exterior walls are sheathed, covered with paper, and then clapboarded. It is painted Colonial yellow, with ivory white trimmings. The roof is shingled and left to weather-finish. Dimensions: Front, 56 ft.; side, 53 ft., not including porches. Height of ceilings: First story, 10 ft.; second, 9 ft.; third, 8 ft. The interior is finished in a handsome manner, and the several rooms on first floor, communicating as they do, make an attractive vista of the principal apartments immediately upon entering. The hall is finished in cherry. It has a hardwood floor, laid in narrow widths, a paneled wainscoting, and ceiling beams. The space between these beams is filled in with smaller panels. The fireplace is built of brick, with facings and hearth of same, and a mantel of excellent design. The staircase is an ornamental one, with spindle, newel posts, balusters, and rail. The drawing-room is treated in china white. It contains an open fireplace, furnished with onyx tiling, and mantel with columns and mirror, and it also contains a bookcase built in on one side of fireplace. Dining-room, trimmed with cherry, is provided with a paneled wainscoting, hardwood floor, and fireplace built of brick. The morning-room is finished similar, and is separated from dining-room by an archway with spindle transom. The bedroom on first floor is fitted up with a hardwood floor, fireplace, two large closets, the latter with stationary bowl, and bath, wainscoted and furnished complete. The butler's pantry, closets, kitchen, and laundry are trimmed and wainscoted with whitewood finished natural, and each apartment is furnished with the usual fixtures respectively. The second floor contains four bedrooms, two bathrooms, dressing-room, large closets, and maid's bedroom. The spacious hall on this floor is finished in cherry, while the remainder of the apartments are trimmed and treated in china white. Bathrooms are wainscoted and furnished replete. The third floor contains three bedrooms and bathroom. The late Mr. J. H. L'Hommedieu, of Great Neck, Long Island, was the architect and builder.

Our engravings were made direct from photographs of the building, taken specially for the Scientific American.



WOOD AND GILT STRUCTURE OF THE UPPER STORY OF THE PARLIAMENTARY CHAMBER.

A DWELLING AT NEW ROCHELLE, N. Y.

We present herewith in this issue, on page 54, a dwelling, recently erected for Dr. Santley Butler, at New Rochelle, N. Y. The building is a unique combination for a physician's office and dwelling, as shown by the plan. It has many excellent features. The underpinning is built of bluestone, with rock faces. The building above is of wood. The first story is clapboarded, and painted yellow, with white trimmings, while the second story is shingled, and stained mahogany color. The roof is shingled, and painted red. Dimensions: Front, 36 ft.; side, 49 ft., exclusive of piazza. Height of ceilings: Cellar, 8 ft.; first story, 9 ft. 6 in.; second, 9 ft.; third, 8 ft. The hall is trimmed with oak. It contains an arch, supported by columns with carved capitals, and forming an arcaded effect. The staircase is a handsome one, with a cluster of carved newel posts. A bay window is thrown out at first landing, provided with a most exquisite stained glass window, shedding a soft and pleasant light over upper and lower halls. Parlor, dining-room, office and reception room are also trimmed with oak, and have parquet floors laid with hardwoods. The physician's apartments are well arranged and conveniently located. Dining-room has an alcove, provided with a stained glass window over buffet. The fireplaces, where shown, are built of brick, and furnished with tiled hearths and facings, and mantels of oak, with columns, mirrors, etc. Kitchen and pantries are trimmed and wainscoted with North Carolina pine. These apartments are fitted up in the most perfect manner with the best modern conveniences. The second floor is trimmed with North Carolina pine, finished natural, and it contains library, sewing-room, three bedrooms, laboratory, large closets, and bathroom; the latter is wainscoted, and fitted up complete, with exposed plumbing. The third floor contains four bedrooms and trunk room. Cemented cellar contains laundry, furnace, and other necessary apartments. Cost $6,800, complete. Mr. Franklin D. Pagan, architect, New Rochelle, N. Y.

Our engraving was made from a photograph of the building, taken specially for the Scientific American.

A RESIDENCE AND STABLE AT MOUNTAIN STATION, N. J.

We illustrate as a subject for our colored plate, and also on pages 52 and 53, a residence, together with stable, which has recently been erected for Mrs. Kathleen Martin, at Mountain Station, New Jersey. The engravings show a thorough American home, with Romanesque feeling, handsomely treated. The broad, massive archway at entrance, stone plaza, spacious piazza, bay windows, and the sloping, graceful lines of the roof are all good features. The stonework, where shown, is built of Indiana limestone, with rough faces; the second story is covered with shingles, and left to weather-finish in a silvery gray color. The roof is shingled and finished similar. Dimensions: Front, 60 ft.; side, 43 ft., not including piazza. Height of ceilings: Cellar, 8 ft. 6 in.; first story, 10 ft.; second, 9 ft.; third, 8 ft. 6 in. The hall and reception hall, broad and spacious, are handsomely trimmed with quartered oak. They have paneled wainscotings and wood cornices. The arcaded effect, which separates the two apartments, is the principal feature, and is formed of massive columns, with carved capitals, rising to ceiling and supporting beam. The staircase is a broad and low one, and is also separated by an archway. It has a paneled seat and a carved newel post. The lavatory is conveniently located under staircase, with all the necessary fixtures complete. The fire-

place is built of brick, with facings of same, and hearth of unglazed tiles. The mantel, and all other mantels, are built of the various kinds of woods respectively, and from special designs, in a most artistic manner, with bits of carving, columns and mirrors. Parlor and library are trimmed with cherry, and are provided with open fireplaces, with tiled hearths and facings of Numidian marble; the latter is fitted up with book-cases built in. Dining-room is a very handsome apartment. It is trimmed with oak, and is furnished with a paneled wainscoting, wood cornice, and an open fireplace, with buffet built in on either side, occupying the extreme width of the room. This buffet has cupboards, with china cabinets over same, and it is elegantly carved, together with the mantel, which forms the combination. There are also china cabinets built in either corner, at the opposite end of the room. The floors throughout are laid with oak, and are highly polished. The butler's pantry and rear stairway are wainscoted, and the former is fitted up with dumb-waiter to kitchen, bowl, dresser, china closets and a large store pantry complete. The second floor is trimmed with whitewood and finished natural. It contains a large, open hall, which is used as a sitting-room, and provided with a bay window thrown out, and paneled seat, four bedrooms, large closets, cozy nooks, two bathrooms, and a large linen closet. The fireplaces where shown are trimmed with tiles and mantels. Bathrooms are wainscoted, and furnished with the best modern conveniences, with exposed plumbing. Third floor contains billiard-room, two bedrooms and trunk room. Cemented cellar contains kitchen, laundry, pantries, servants' hall, furnace room, cold cellar and other apartments, all furnished in their respective appointments complete.

We also present a model stable and carriage house. It is treated with good elevations in harmony with the architecture of the house, and in keeping with its surroundings, and the interior is furnished with the best modern fixtures replete. The foundation is built of stone partly, and of good red brick, laid up in red mortar. The exterior framework is sheathed, shingled, and left to weather-finish, while the trimmings are painted white. The roof is gracefully lined, and is finished with an octagonal cupola as ventilator. The dormer windows, thrown out, give height, light, and ventilation. This roof is shingled and finished natural. Dimensions: Front, 45 ft.; side, 34 ft. Height of ceilings: Cellar, 9 ft.; first story, 10 ft.; second, 8 ft. 6 in. The site is so graded that it gives ample stable room on ground floor, with entrance at the rear, and to carriage room by an inclined way. The stable contains two box-stalls and six single stalls, trimmed with the usual ornamental iron fixtures. The floor is concreted, and the ceiling and walls ceiled up with narrow beaded yellow pine. The first story contains a large carriage room with carriage wash, harness room with closet, inclosed with sliding glass doors, and a stairway to the second story, which contains the groom's apartments, hay loft, feed box and shutes to ground floor. The walls and ceilings on first and second stories are ceiled with yellow pine, finished natural. Messrs. Wilbur S. Knowles and Alfred H. Thorp, architects, 21 West Twenty-fourth Street, New York.

Our engravings were made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.

A MODEL DWELLING.

We present on page 55 a model dwelling which has recently been erected for Warren H. Lamson & Company, at Bridgeport, Connecticut. The design is attractive, having many good features as shown in the perspective elevations, and a plan unique, which is handsomely trimmed and provided with all the best modern conveniences. The underpinning is built of rock-faced bluestone. The exterior framework above is covered with clapboards and shingles, and painted light olive green, with bottle green trimmings. The roof is covered with octagonal cut slates. Dimensions: Front, 26 ft. 6 in.; side, 46 ft., not including piazza. Height of ceilings: Cellar, 7 ft.; first story, 9 ft.; second, 8 ft. 6 in.; third, 8 ft. The front entrance is provided with double doors glazed with beveled plate glass. The hall is trimmed with oak. It has a seat and an ornamental staircase with balusters, rail, carved newel posts, and an archway separation with spindle transom. Parlor, library, and dining-room are trimmed with ash; the two former are separated by an archway provided with an ornamental transom, filled in with spindle work. Parlor and dining-room have hardwood mantels of good design. The floors are of hardwood. Butler's pantry and kitchen are wainscoted and furnished with the usual fixtures. Second floor is trimmed with cypress, and is finished natural; it contains three bedrooms, alcove, and bathroom, the latter wainscoted and fitted with exposed plumbing. Third floor contains two bedrooms and ample storage. Cemented cellar contains furnace, laundry, and other necessary apartments. Cost $3,200, including furnace and everything complete, ready for occupancy; could be built for $2,900 to $3,000 by substituting whitewood in place of the hardwood used as trimming. Mr. Harrison G. Lamson, architect, 328 Main Street, People's Bank Building, Bridgeport, Connecticut.

Our engraving was made direct from a photograph of the building, taken specially for the SCIENTIFIC AMERICAN.

STABILITY OF LOFTY BUILDINGS.

Although the exaggerated vertical proportions of the modern office building render it, architecturally speaking, somewhat grotesque, there is no doubt that the steel "skeleton" system upon which it is built provides all the necessary rigidity and strength. The vast areas of towering wall which these buildings present to the wind naturally raise the question of their ability to withstand the accumulated pressure which must result when they are exposed to a gale of any strength.

The vibration of lofty buildings has ever been a favorite theme with those who write in the field of engineering romance.

The party who, not so long ago, gravely assured the public that the lantern at the top of the Eiffel Tower swept to and fro through an arc of ten feet, in response to the fiercer gusts of a storm, was shortly afterward followed by another writer, whose pen, more given to fluency than to fact, wrote down a detailed account of the vibrations of a certain well known office building, which were described as being so severe as to stop the clocks on any but the lowest stories! Factory chimneys, church steeples, lofty monuments, and, in fact, every structure that raises its head much higher than its fellows to the buffeting of the elements, are locally credited with feats of more or less impossible vibration.

That tall factory chimneys do sway to and fro in a high wind, and that a poorly constructed building will rock, can be proved by careful instrumental tests, and in extreme cases the motion can perhaps be detected by the eye, but the frequency and extent to which such movements occur have been vastly exaggerated.

It would be natural to suppose that the elasticity of the steel framework of a fireproof building would allow of a certain amount of "give" or spring, under the severe bending stresses to which it is subjected by wind pressure.

We have been favored with the result of an instrumental test, which was recently carried out on the twenty-first floor of the American Surety Building, Broadway, New York, by the engineer and superintendent of the building, Mr. J. Turner. It was made during the height of the heavy storm which prevailed during January 4, when an official wind velocity of 82 miles per hour was registered in the neighboring station. The test failed to give the slightest evidence of vibration; a result which agrees with the testimony of the inmates, that in a gale the topmost floors are as still as the first stories. The test was made with transit and level, and though it was not a test of the highest instrumental character, the result was remarkable, for both the plumb bob and the bubble remained perfectly still, even when the building was struck by the heavier gusts of wind.

We confess to some surprise at this practically absolute rigidity; for the absence of any building on the opposite side of Broadway, and, indeed, on that part of the whole block which lies immediately in front of the Surety Building, makes it certain that practically the full height, from curb to coping, was exposed to the shock of the storm. Just how great was the bending strain set up within the building is a matter of easy calculation. The front exposed to the wind is 84 feet 8 inches wide by 314 feet high, giving a total of 26,585 square feet. The wind pressure corresponding to 82 miles per hour is somewhat problematical, for, although experimentalists have discredited Smeaton's formulæ, they have given us no substitute upon which they are well agreed among themselves. Smeaton gives 31 pounds per square foot as the pressure corresponding to 80 miles per hour. This is undoubtedly too high. Prof. Martin's formula, pressure $= 0.004V^2$, works out at about 25 pounds to the square foot, which we will assume to have been the maximum pressure on this occasion.

This gives a pressure on the whole front of 332 tons, and a bending or overturning moment of over 52,000 foot tons. These figures give us an impressive idea of the solidity of a construction which proves to be quite insensible to such powerful disturbing forces. It must be due to the combination of a thoroughly well riveted steel structure with the inertia and rigidity of massive walling, into which it is tied and built.

Architectural Notes.

There is noticeable in the latest designs for domestic and public buildings an increasing tendency toward simplicity, both in general outlines and in the details. In the history of architecture a decadence in the art has generally been accompanied by a profusion of ornamentation and an overelaboration of details. True beauty in architecture is something inherent and inseparable from the building. If it is not inherent, it can never be added from without. No amount of veneer in the way of lavish ornament can cover up inharmonious proportions, or cheat our æsthetic senses into believing that building to be beautiful which is merely ostentatious.

Legislation is moving in the matter of the "sky-scraper" office building. In the Chamber of Commerce of New York, the following resolutions have been presented:

"WHEREAS, The continued erection of tall buildings would be a menace to the health and welfare of our city; be it

Resolved, That the Chamber favors the passage by the State Legislature of laws:

1. To limit the height of buildings in this city in proportion to the width of the street.

2. That all buildings over eighty feet high shall not occupy more than eighty per cent. of the ground they stand upon, a restriction similar to one now applied to tenements.

3. That such buildings shall be provided with at least two fireproof staircases, and that all shafts for stairs and elevators be incased in brick walls and be lighted from above."

The bill in the Senate of New York State relating to the same matter provides that no building shall be erected whose height shall be greater than fifteen times the square root of the width of the street. If the street is over 100 feet in width, the basis of calculation shall remain at 100 feet. Corner buildings, where the abutting streets are 160 feet wide, may be carried as much higher than this as the Health Department, the Superintendent of Buildings, and a member of the Fine Arts Federation may permit. Also, the part of a building which is set back from the street may be carried higher by an amount equal to twice the distance of its front from the street line. A corner building which fronts on two streets, one of which is narrower than the other, may be carried to the height which it has on the wider street, for a distance of 100 feet on the narrow street.

The committee appointed to prepare plans for a monument to the late Richard Morris Hunt, has suggested a very appropriate memorial. Some thirty years ago Mr. Hunt prepared a design for a gateway at the entrance to Central Park, New York City, on Fifth Avenue and Fifty-ninth Street. This was the most important among a series of such designs, which Mr. Hunt submitted for all the entrances to the park. It is proposed to honor the memory of the distinguished architect by having this design carried out in an adequate and befitting manner. *The American Architect and Building News* says, in this connection, that "by the custom of the Park Commission, no structure connected with the park is allowed to commemorate by name any person, living or dead; but, as the committee say, it is generally known that the gates were designed by Mr. Hunt, and the guide books of the future will keep that fact before the public mind; so that there is no real need of inscribing the name of the artist upon the work. To carry out the design completely, including suitable sculpture, as intended by Mr. Hunt, will cost about $190,000, or more, if bas-reliefs are placed on the pedestals of the statues; but it seems probable that the city would contribute to the expense."

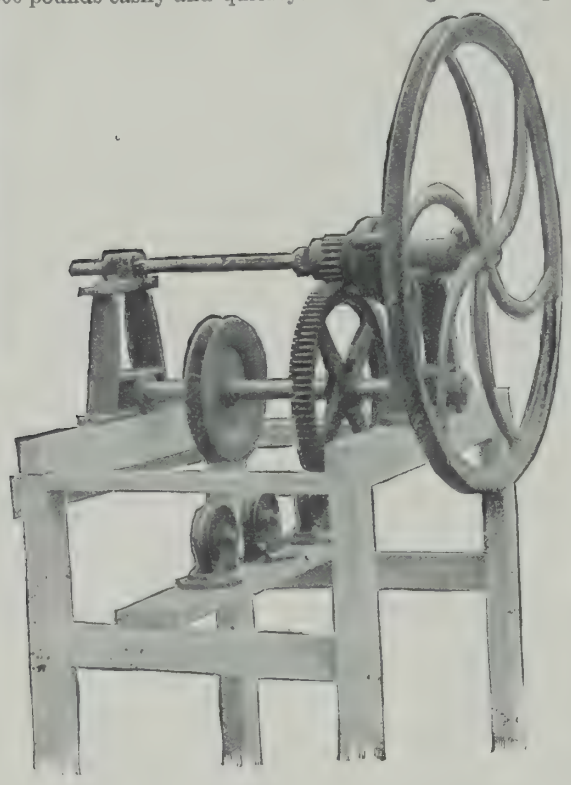
The prize-winning plans for the competition for the proposed new City Hall, New York City, were placed on view at the Architectural Leagues' Exhibition, on Saturday, March 7. The $7,000 prize was awarded to Mr. E. G. Thomas, whose design is for a building in the French Renaissance style. It is noticeable that all the plans contemplate a building which would occupy a larger area than the present City Hall. With the exception of the design by Mr. B. J. Weber, of Chicago, all of the plans favor the French Renaissance. It is noticeable that all the competitors have followed to a great extent the lines of the justly celebrated Hotel de Ville in Paris.

In his lecture on architecture before the Architectural League, on February 26, Prof. A. D. F. Hamlin made the following distinction between the architect, the engineer and the builder: The first deals essentially with the æsthetics of architecture, the second with considerations of the strength of the materials employed, and the mere builder may or may not concern himself with the first two considerations. The architect does not, strictly speaking, include the engineer. He may plan an architecturally perfect building, considered as an object of art, which may yet be faulty as a work of engineering. A building, again, may be at once an engineering triumph and an architectural eyesore.

AMERICAN architects will feel themselves pleasantly complimented on learning that a book is to be published in Germany expressly devoted to American architecture. As the *Deutsche Bauzeitung* says, in speaking of the work, the recent architectural achievements of the North Americans, by their peculiar characteristics, have become the object of general and increasing interest, and it is felt in Germany to be desirable to possess some publication which will give a more complete and intelligent account of them than can be obtained from periodical publications. With the view of providing for this want, Herr Max Junghäudel, of Berlin, who is already known in the profession by his studies of Spanish and Egyptian art, is now in America, making the necessary studies; and our contemporary hopes that the profession in this country will do what it can to assist his investigations.—*Architecture and Building.*

IMPROVED DUMBWAITERS.

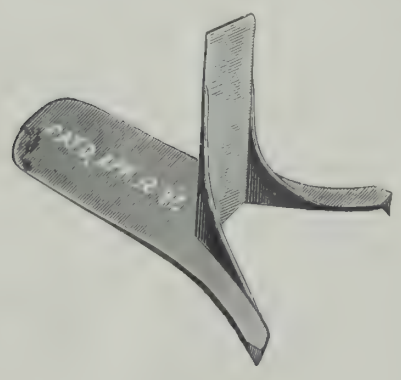
The F. S. Hutchinson Company, 32 Warren Street, New York, manufacture a very complete line of dumbwaiters, comprising the "Paragon Self-Retaining," a positive automatic; the "O. K.," a semi-automatic, and the "Simplex," a good dumbwaiter for a little money. The illustration shows the mechanism of their No. 8 "Paragon," geared for a capacity of 500 pounds, for use as dumbwaiter, invalid or trunk lifts, and light store or factory elevators, where it is desired to carry loads up to 500 pounds easily and quickly. It is designed to be put



in position by any good mechanic. The locking device holds the load at any point, automatically, without the aid of any check rope, clamp, catch, or other auxiliary part. The machine is always locked, excepting when a pull is made on the hand rope, to raise or lower; then the lock is released, and the car ascends or descends at pleasure so long as the hand rope is operated. The releasing mechanism is connected directly to the shaft on which the hand wheel is fastened, and, no matter what the load on the car may be, the hoisting wheel or sheave which engages the lifting rope will not revolve until a pull is made on the hand wheel. A catalogue, showing different styles, together with description and price lists, will be mailed on application.

BECKWITH'S PATENT ROOFING BRACKET.

The accompanying cut represents a bracket for holding staging on roofs, to facilitate shingling, repairing, painting, etc. It is made of malleable iron, and the more weight put upon it the more firmly it is kept in place. This bracket, when once in place on a roof, is not liable to



trip or slip out of position. It has been thoroughly tested on steep or flat roofs, and is quickly and easily applied or removed. It has been patented and is being put on the market by E. L. Beckwith, Box 238, Niantic, Conn.

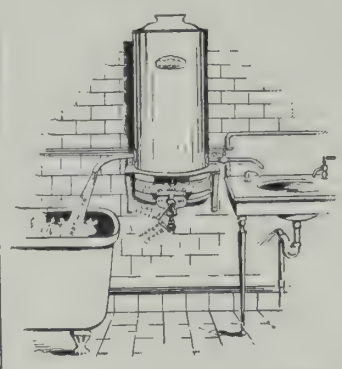
Bangor Roofing Slates.

The Bangor Excelsior Slate Company, miners and manufacturers of genuine Bangor (Pa) roofing slates, have recently doubled their shipping capacity, and can load a car within an hour after receiving the order. This company (R. S. Brown, proprietor) operates ten derricks, and expects to produce from 40,000 to 45,000 squares this year. Large shipments have been steadily made for some years to London and Liverpool, England, and principal points on the Continent, and it is said the slate compares favorably with the best Welsh slate. It is practically indestructible, and will outlast any building on which it is placed. All genuine Bangor slate is accompanied by a certificate, and that from the "Bangor Excelsior Quarry" is claimed to be the best medium priced slate in the world.

According to a wholesale furniture dealer, the best furniture polish is made of one-third alcohol and two-thirds sweet oil. Apply it with a soft cloth, and rub with another cloth.

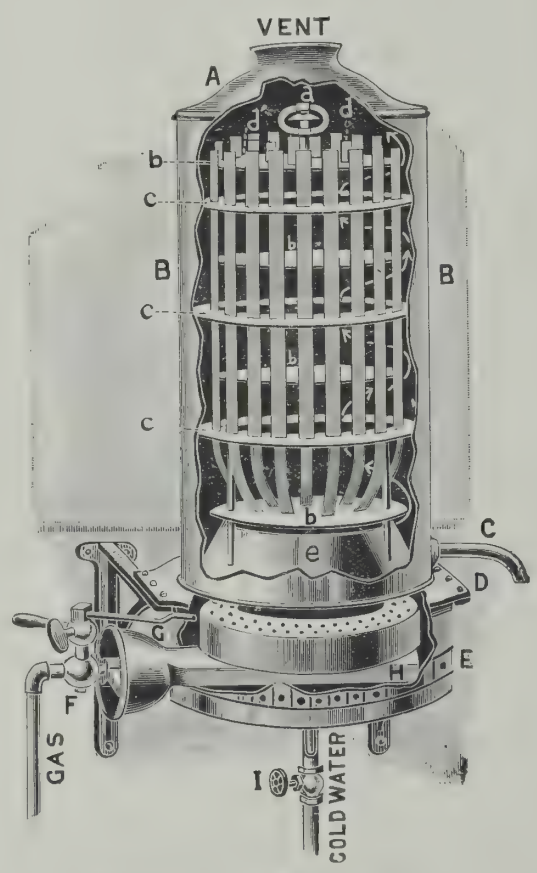
A WATER HEATER FOR BATHS, ETC.

The Horix Manufacturing Company, Cleveland, Ohio, with their "Lightning" Instantaneous Water Heater, render it very easy to obtain a ready supply of hot water, heated to any degree from 170° to 180°, for bathroom purposes. This heater, though small, is a wonderful contrivance for heating water instantly, conveniently, and with surprising economy. You simply turn on the water, light the gas by means of a pilot light, and you have a running stream of hot water, the temperature of which can be regulated. The No. 2 heater, shown in the cut, is twenty-four inches high and twelve inches in diameter, and will supply a comfortable bath in about ten minutes, at an expense of less than two cents for gas.



THE "LIGHTNING" WATER HEATER.

The large view illustrates the internal construction of the heater, and will aid the reader in understanding the principle of its make-up and operation. The course of the hot water is shown by the curved arrows. The water enters through pipe I, and passes up to an adjustable spray, marked *a*, in the top of the heater. The spray directs the water against the copper strips, and otherwise in a way to make it pass over the plates, *b*, *b*, *b*, and down the inside of copper shell of the heater. The heating water finally lands in the annulus between the cone, *e*, and the walls of the heater. At this point the water gets the



THE "LIGHTNING" HEATER, SECTIONAL VIEW.

full benefit of the heat from the burner, and, being already hot with the heat, absorbed in its course downward, emerges very hot from the outlet spout at the side. The heat, which is obtained from an improved atmospheric gas burner, passes into the case of the heater between the cone, *e*, and the plate, *b*, and upwards by an alternating course through rings, *c*, and plates, *b*, *b* (white). There is no consumption of gas except when the heater is actually in operation. An ingenious duplex gas cock and water valve, with which these heaters are fitted, makes it impossible to have the gas turned on while the water is off. The makers have spared no pains to perfect the heater, and are pleased with the impression it has made on the market. They are daily in receipt of the most flattering testimonials as to its excellence and high efficiency.

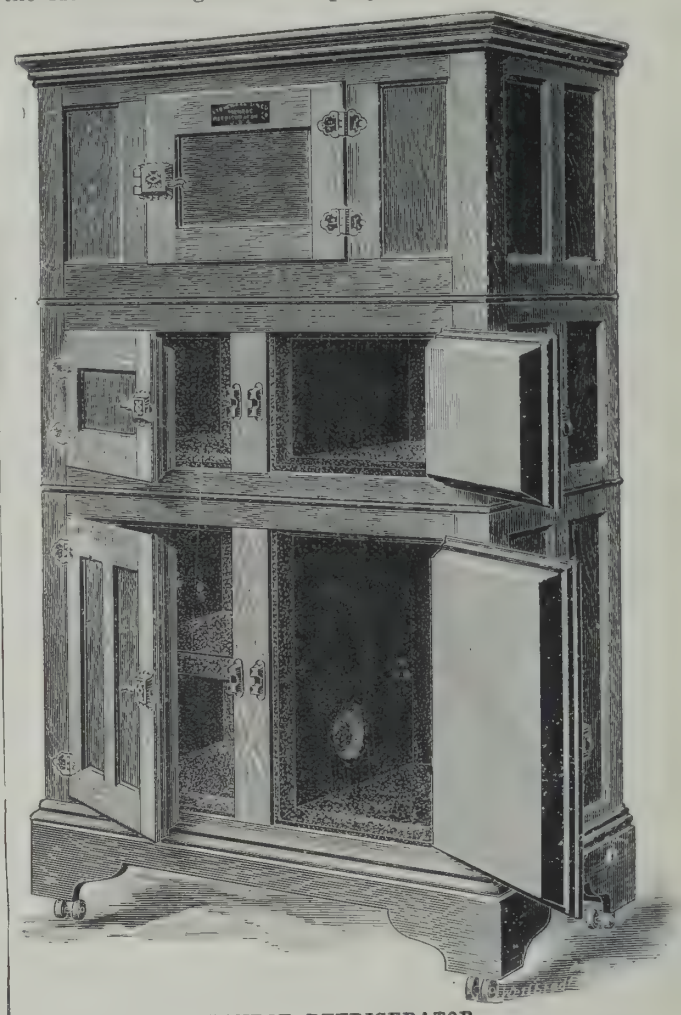
Clinkers may be removed from grates and ranges by throwing half a dozen oyster shells into the fire when the coal is aglow, and covering them with fresh coal. The clinkers are made soft by this means, and are easily disposed of.

A TEN CENT CARD HOLDER.

The little device shown in the cut is designed for attachment to the front door, to receive and hold the cards of callers when one is not at home. It is made by the A. J. Phillips Company, of Fenton, Mich., in natural oak, varnished, and presents a neat appearance. It is attached to the door or door frame with a nickeled screw.

STONEWARE LINED REFRIGERATORS.

Of all the materials which have been employed in the making of refrigerators, nothing has proved so entirely satisfactory in every respect as the use of a solid stoneware lining for the inclosed compartments in which food is kept, such linings, of course, being efficiently backed up and supported by a firm and proper casing. Stoneware lasts forever, and is always clean, and refrigerators in which it is used have none of the odor of those which are wood lined, and none of the oxides of zinc lined refrigerators. The accompanying illustration represents a stoneware-lined refrigerator, size No. 5, made by the Monroe Refrigerator Company, of Lockland, Ohio,



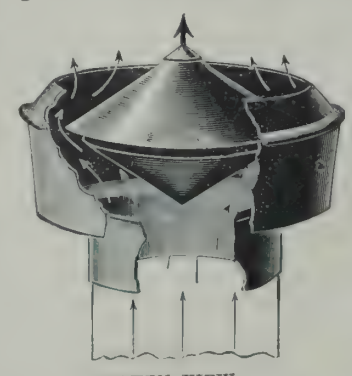
THE MONROE REFRIGERATOR.

eacn lining being in one piece, and moulded to fit the box, according to a patented process owned by the company, and the lining being vitrified and glazed with a glaze which will not craze or wear off. It is made of oak lumber, and has four stoneware provision compartments, each 16 x 16 inches, and 10 inches high. A provision and meat compartment, 17½ x 19½ inches, and 24 inches high, too large in ordinary practice to line with stoneware, has a slate slab bottom, and its walls are lined with indurated fibre, a thoroughly impervious substance. In these refrigerators there is no mingling of flavors, and no "sweating," nothing to get sour or musty, the circulation being always good and the cold air dry and pure. The company has prepared a very artistic catalogue illustrating and describing their full line of refrigerators, which will be mailed free on application.

Dixon's Silica Graphite Paint has been favorably known for over a quarter of a century. Roofs painted with it have not required repainting in twelve to fifteen years and over. Railway and other corporations known for their thorough testing and careful selection of materials use this paint in large quantities. Any one desiring to know more about graphite paint should address the Joseph Dixon Crucible Company, Jersey City, N. J.

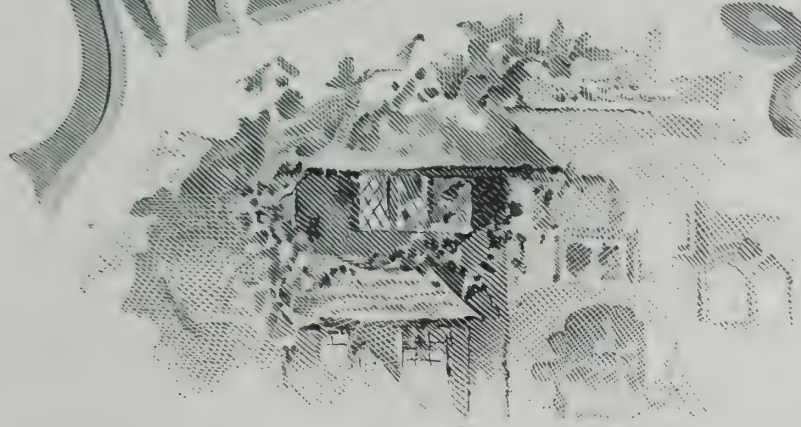
THE PANCOAST VENTILATOR AND CHIMNEY COWL.

This improved device, shown in the accompanying illustration, for insuring rapid egress of air and preventing back draught, has been proved to be of the highest efficiency, for, no matter in what direction the wind blows, it always augments the up-draught. The exit passage way is of uniform area throughout, and with the least angular and shortest lateral divergence, preventing choking. It is also strong and durable, being put together with a specially invented form of brace, so that it cannot sag from rough usage. These ventilators are made of the best black metal, galvanized, and there are no raw or unprotected edges. They are manufactured by the Pancoast Ventilator Company, 907 Drexel Building, Philadelphia, Pa.



BROKEN VIEW.

SCIENTIFIC AMERICAN



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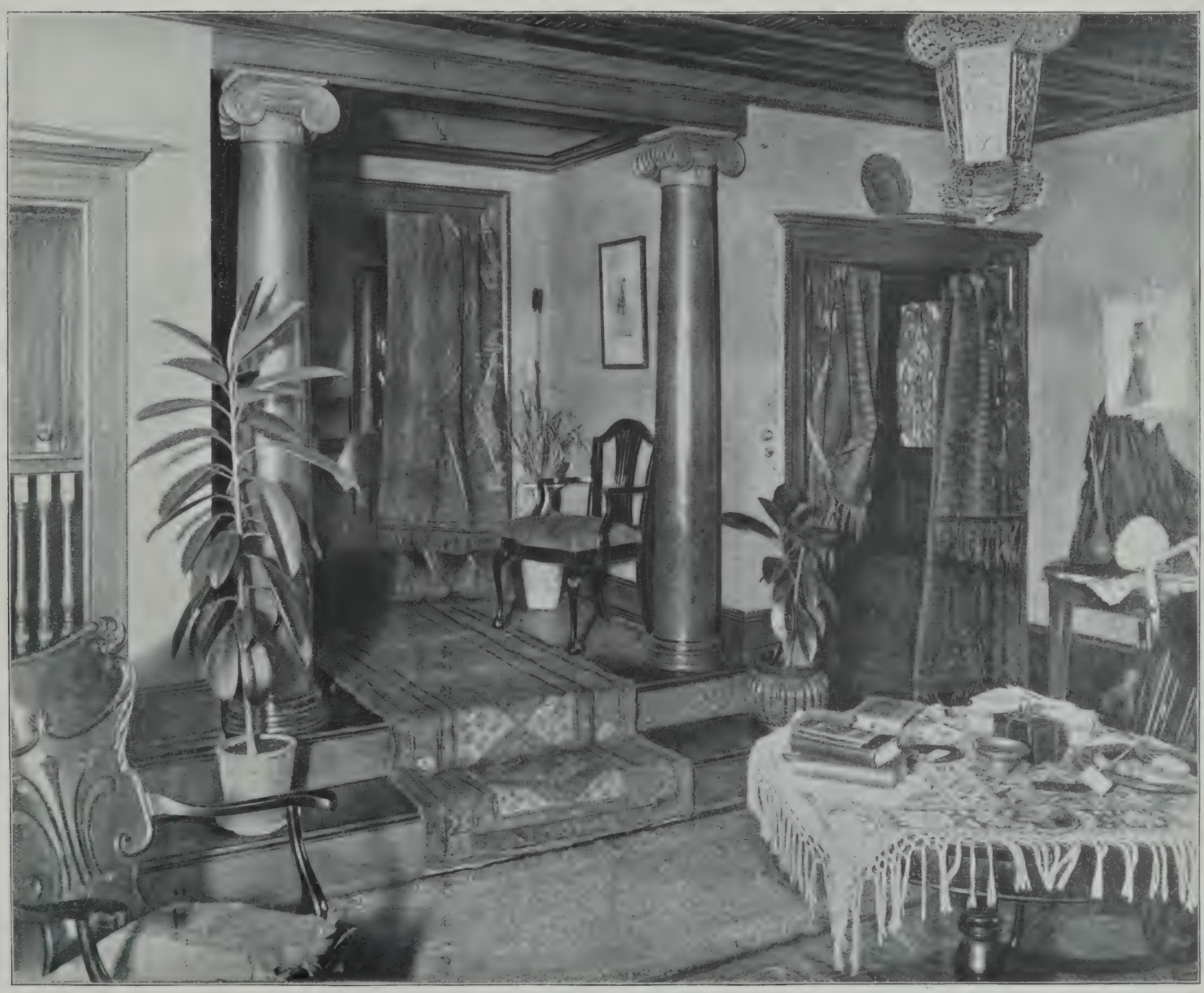

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INTERIOR VIEW OF THE RESIDENCE OF EDWARD H. BOUTON, ESQ., ROLAND PARK, BALTIMORE, MD.

See page 78.

Scientific American.

ESTABLISHED 1845.

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NEW YORK, MAY, 1896.

THE

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BUILDING EDITION.

ESTABLISHED 1885.

$2.50 a Year. Single Copies, 25 cents.

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SCIENTIFIC AMERICAN, BUILDING EDITION.

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NEW YORK'S NEW CUSTOM HOUSE.

In considering the question of providing enlarged accommodation for the Custom House, it should be borne in mind that the adjacent Treasury Building is becoming too small for its duties. It is only a question of time before the city will have to provide a new site for a larger building for this purpose; and a far-sighted policy would suggest that the two questions be considered at one and the same time.

It has been suggested that, if the new Custom House were erected at Bowling Green, as originally proposed, and as will yet, we sincerely trust, be done, the present Custom House site, at the corner of Wall and William Streets, would be available for the use of the Sub-Treasury, for which it would provide ample accommodation.

This suggestion meets the chief objection which is being urged against the transfer of the Custom House to Bowliug Green, namely, that it will involve an unnecessary expenditure of money. It is claimed that to sell the Wall Street property, purchase the new site, and erect a building thereon, will cost more than to pull down the present building and erect another in its place; and that any sentimental reasons which may exist in favor of the Bowling Green site do not justify the extra outlay.

We see no reason to assume that the Bowling Green proposal will cost more than the other; indeed, there are good reasons to believe that it will cost less. During the negotiations for the sale of the present Wall Street property, which would probably have been carried through but for the panic of 1893, a sum was named, not far short, we believe, of $4,000,000. It was recently stated, in evidence before the House Committee on Public Buildings, that under government condemnation proceedings the Bowling Green property had already been valued at $2,101,000, and that the present site could be sold for about $4,000,000. Now, assuming that the value of the old material of the Custom House would only cover the expense of pulling it down, there would yet remain a handsome sum in hand toward defraying the cost of the new building.

If, again, the present site is retained for the use of the Sub-Treasury, the Government will be the gainer in the long run, for the purchase of some other site and the erection of a new Treasury Building upon it anywhere in the present neighborhood w ll certainly cost more than the $2,000,000 which would have to be paid for the Bowling Green property. The Treasury cannot be removed to such a location as is proposed for the Custom House. There are questions of commercial convenience, such as economy of time and reduction of risk in the conveyance of securities, etc., which render it strongly advisable to reserve the present Custom House site for Treasury purposes. It is a *sine qua non* that, on whatever site a new Treasury Building be put up, it shall be situated in the centre of the district devoted to the great banking and insurance institutions. To remove it elsewhere would be to subject them to certain risks and a loss of time which would be intolerable. By the proposed arrangement, not only would the location of the Treasury Building in the heart of Wall Street be permanently assured, but by the erection of the new Custom House at Bowling Green the city of New York would be enriched by the possession of an important public building of imposing proportions, standing in as commanding a location as could be found in the whole length of Manhattan Island.

It has been urged that this question of erecting public buildings is not in any sense a sentimental one; that it should be judged merely as a matter of expediency. We have shown that the Bowling Green proposition can stand the test of expediency. It is less costly, and, if taken in connection with the proposal to transfer the Treasury to the vacated site, it may save much subsequent expense and annoyance.

SUBURBAN HOMES IN ROLAND PARK, NEAR BALTIMORE.

The houses represented in this issue are taken principally from Roland Park, a new and delightful suburb of Baltimore. The only protection for our residential suburbs against the inroads of business and other nuisances is the formation of parks and protective associations, and the excellent results which follow when the residences are designed and built upon a general plan or system may be seen by examining the views presented on the accompanying pages. Roland Park is one of the very best, most attractive, and most complete suburban places near any large city in America. It is situated at the northern limits of Baltimore, being four miles from the City Hall and Post Office, and it is on a high plateau, which, in this short distance, attains an altitude of 395 feet above tide. The rise is so gradual, however, that from the electric cars one hardly notices that he is ascending. The place possesses great natural beauty, having a great deal of shade and a rolling surface. Its treatment for the purpose of transforming it into a residential section has been intelligent and comprehensive. A complete system of sewers has been laid in every street, so that all houses built on the property can be connected with the same. The system is the one which represents the latest and best developments in sanitary science, it having been designed and superintended by Col. George E. Waring Jr., the present Street Commissioner of New York. An independent water system, equally complete, has been installed, the water mains having been laid in every street. It is a gravity system, a continuous and unvarying pressure being furnished from the water tower, which is seventy feet high, and located on the highest point of the property, with a capacity of 165,000 gallons. The sources of supply are springs and artesian wells, the water of which has been analyzed by Prof. Tonry, of Baltimore, and pronounced equal in purity to that of any of the famous mineral springs. Excellent granolithic and asphalt sidewalks have been laid on every street. The roads have been graveled, and rolled with heavy rollers, gutters have been laid, trees planted, and a parklike air given to the whole place. Well considered building restrictions prohibit the erection of houses, on a majority of the streets, costing less than $3,000. On Roland Avenue no house may be erected costing less than $5,000. Roland Avenue, which is the principal avenue of the park, is 120 feet wide, the electric cars being located in the middle, between a row of shade trees. The transportation facilities are all that can be desired. The electric cars run directly, without change, from the park to Baltimore Street, the centre of the city. The first houses were started in Roland Park a little over three years ago. There are now somewhat over one hundred homes, the excellent character of which will be understood when it is known that they have cost over half a million dollars. All the streets and houses are lighted by electricity, which is secured at the rate of 10½ cents per thousand Watts. In order to maintain the strictly suburban character of the park, the various stores have been located together in one block, in which the picturesque Flemish architecture has been employed to good effect.

Architecturally speaking, there is everything to be said in favor of the system of building up the suburbs of a city in well regulated parks, where the proposed buildings are subjected to restrictions as to cost and design. Where the size and style of suburban buildings, and their location, are left entirely to the caprice of the speculative builder or the individual owner, the general architectural effect is liable to be inharmonious, if not, at times, absolutely grotesque.

RESIDENCE OF J. M. PALMER, ESQ., BALTIMORE, MD.

We present on page 76 one of the many interesting houses at Roland Park, Md., a suburb of Baltimore, the residence of J. M. Palmer, Esq. The design shows a unique treatment of an all shingled house. Its shingles are laid in projecting tri-courses, relieving the straight lines of the building, otherwise only broken by the slightly projecting bays and gabled porches. The entrance gable, supported by slender turned columns, is plastered, and decorated with composition ornament. The main roof is gabled, and well broken in front by three dormer windows. Underpinning of rock-faced local stone. Exterior framework above sheathed, papered, shingled (as mentioned), and allowed to weather finish. Roof similarly treated. Trimming color, cream. Blinds, dark green. Chimneys of brick, cement capped. Dimensions: Front, 46 ft. 2 in., exclusive of porch projections; side, 37 ft. 1 in., including rear but not front porch or bay projections. Heights: Cellar, 7 ft. 6 in.; first story, 9 ft. 3 in.; second, 8 ft. 7 in.; attic, 7 ft. 8 in. Entrance door opens into central hall, with staircase of easy rise at end, having square newel, four straight balusters to the tread; seat at side; sliding doors to parlor (in white enamel) and library. Dining-room, with flat arch to nook, having closet at side, has fireplace, faced with burnt Sienna tiles; mantel over. Other fireplaces are also tiled, and have mantels of neat design above. The butler's pantry is provided with closet, dressers, and sink. Passage leads to kitchen, with usual fixtures. Finish, except where otherwise noted, cypress. Second floor divided into four chambers, all with closets, two with fireplaces, and principal one with large dressing-room. The bathroom provided with best fixtures; plumbing exposed. Linen room, with shelving, etc. Attic has one large, two smaller bedrooms, and hall, finished off. Entire cellar cemented, and contains laundry, heating apparatus, fuel storage, etc. Built by the Roland Park Co. Messrs. Wyatt & Nölting, architects, Baltimore, Md.

Our engravings were made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.

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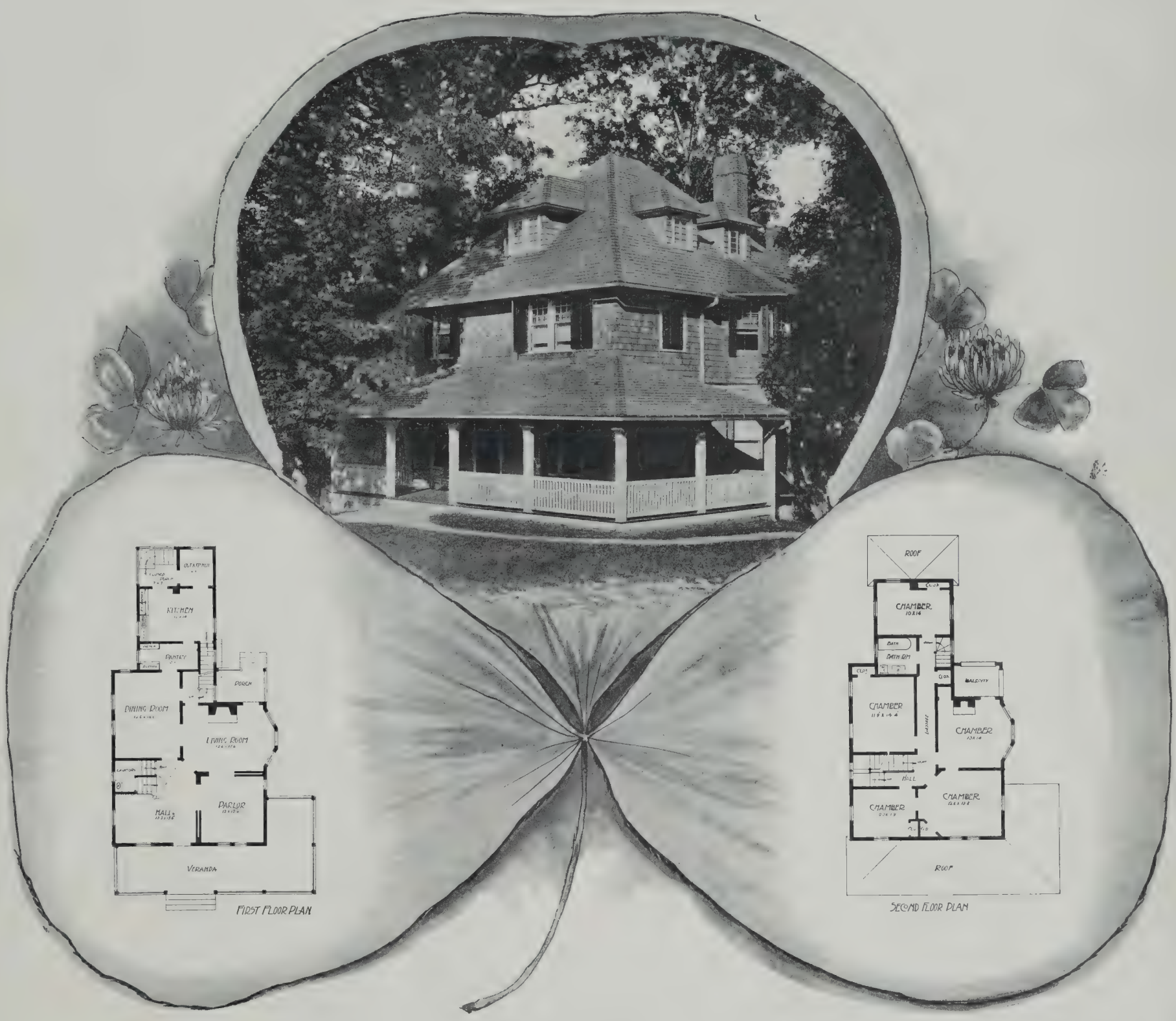
A SUBURBAN COTTAGE.

The floor plans and view shown of cottage is owned by W. C. Van Sant, built from the design of W. L. Price, architect, of 731 Walnut Street, Philadelphia. The general treatment and detail is a combination of old Colonial and Dutch styles. There is a wide veranda carried across the front and returning on the side; the roof is shingled and carried on square posts, arched at top; balusters are square, set closely and plain. The first story of building has beveled siding on exterior, with windows, doors, and corners trimmed with bands and belts. The second story is shingled to eaves, which project about three feet, ceiled with narrow ceiling. The entire roofs and sides of dormers shingled. The chimneys above roof are faced with Philadelphia face brick, and topped out in neat design. The bay window is carried up through both stories, forming an agreeable break in main roof. Shingles of roof and sides left to weather, giving the entire building a soft gray tone of color. Trimmings and bands, olive green; siding, cream color. The width of front is 29 ft. 6 in.; depth, 57 ft. 6 in., over all. Cellar, 7 ft. 6 in. high; first story, 9 ft. 6 in.; second story, 8 ft. 6 in.; attic, about 8 ft. Main hall is large and well lighted, with lavatory under the stairs, which are finished in oak, carved square newels, tapering balusters, and paneled strings. Sliding doors to parlor, which is finished in whitewood. Dining-room and living room are tinted cream color. Mantel in dining-room is carved oak, with tile facings and hearth. A large pantry separates the dining-room from kitchen, and rear staircase leads to upper floor from passage. The cellar stairs go direct from kitchen: there is also an out kitchen, and inclosed porch in extension. Usual fixtures in pantry and kitchens; bathroom conveniently situated; fine, well lighted, commodious chambers, closet in each. Two large rooms in attic, finished in plaster, for storage and drying purposes.

Our engravings were made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.



A SUBURBAN COTTAGE.

A SUBURBAN RESIDENCE.

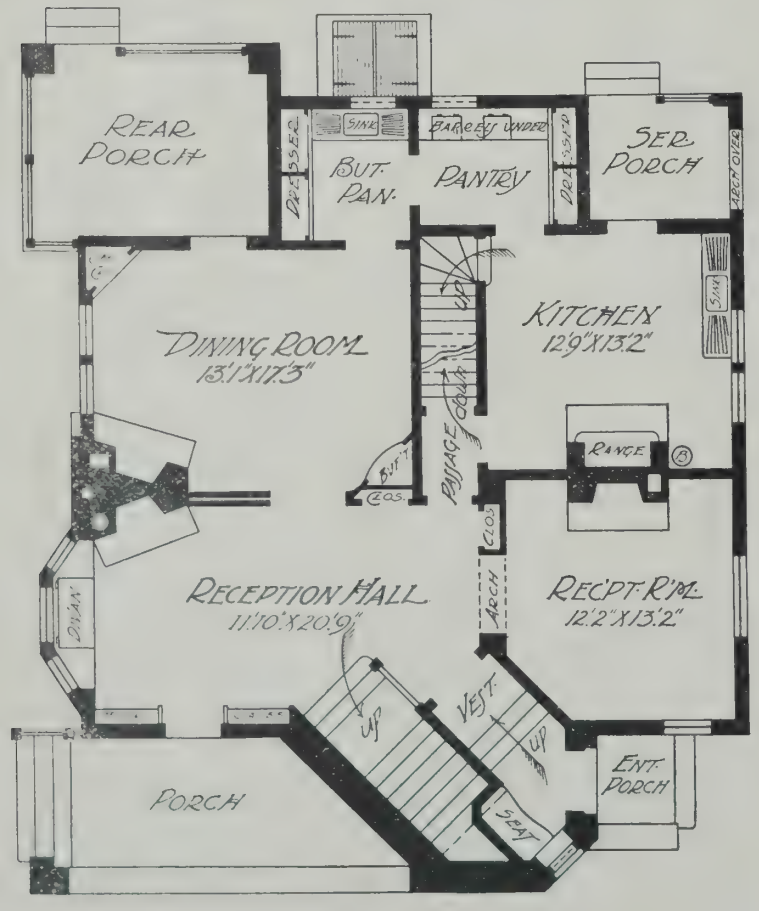
Our illustrations on page 72 represent the residence of William E. Baitzell, Esq., at Roland Park, Baltimore, Md. Underpinning and porch wall of dark gray local stone, laid with joints well broken. Exterior framework above sheathed, papered, shingled, and stained light gray. Trimming color, yellow; lighter tint for sash. Chimneys of red brick, with corbeled out and returned cap. Upper sash of most windows leaded with cathedral glass, although some wooden muntons have been used. Dimensions: Front, 45 ft. 4 in; side, 34 ft. 5 in., not including bay or porch projections. Heights: Cellar, 7 ft; first floor, 9 ft.; second floor, 8 ft. 6 in.; attic, 8 ft. Entrance door with upper panel glazed, leads through wainscoted vestibule into reception hall, in oak, with angle fireplace, faced with unglazed terra-cotta tiles; seat at side, having leaded window over; arch over at staircase, with carved cheek and newel, turned balusters, etc., walls covered with cartridge paper. Parlor has angle fireplace, tiled, with oak mantel having mirror over; trim, cypress; walls, papered. Dining-room, walls also papered and similarly finished; has dresser and sink in the butler's pantry, which is means of communication with kitchen, with usual fixtures; laundry in rear. Second floor has three chambers of good size, with closets across the front; bathroom and linen closet. Attic has one servant's room finished off, and storage space. Cellar, cemented, contains heater, fuel storage, etc. Built by the Roland Park Co. W. L. Price, Esq., architect, 731 Walnut Street, Philadelphia, Pa.

Our engravings were made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.

RESIDENCE OF JAMES W. COCHRAN, ESQ., ROLAND PARK, BALTIMORE, MD.

Our color illustration in this issue represents the very interesting residence of James W. Cochran, Esq., at Roland Park, Baltimore, Md. Another view and floor plans will be found on page 68. The octagonal tower, overhanging gable roof, and broad treatment of dormers form the principal features of this effective exterior. Underpinning, lower portion of tower, porch, piers, and cheek at steps are built of local stone, laid with good color effect and joints well broken; all exterior framework above sheathed, papered, shingled, and stained deep gray; roof also shingled, and stained moss green; chimneys of brick and capped with stone. Dimensions: Front, 35 ft. 9 in., exclusive of bay; side, 27 ft. 9 in., not including tower. Height: Cellar, 7 ft. 6 in.; first story, 9 ft.; second, 8 ft. 6 in.; attic, unfinished. Entrance door, with divided sash above, and hung with wrought iron hinges, opens on vestibule, with seat at side, and decorated with relief; several steps up to main floor level; inside door is also glazed, and opens on reception hall; walls tapestried, pale green in tone. Ceiling decorated in relief, tipped with gold; stairs wind around the tower, in oak, with long leaded window at landing; angle fireplace, faced with green tiles, has mantel shelf above of neat design; seat in bay; trim, tinted pine; sliding doors to dining-room; walls and ceiling treated in same manner, tapestry being terra-cotta in color and paneled off; trim in darker tint; angle fireplace has carved cherry mantel with beveled mirrors over, angle buffet, and china closet. Reception or drawing room, in cream enameled pine, relief ceiling, tapestried walls, paneled off, and fireplace tiled, mantel over. Butler's pantry and kitchen pantry, with dressers and sink, are means of communication from dining-room to kitchen, with usual fixtures. Second floor divided into four chambers, with closets and fireplaces, large linen closet with shelves, drawers, etc.; bathroom with enameled tub and marble basin; all plumbing exposed. Separate toilet, servant's room and bath. Cellar, cemented, contains laundry, hot air heater, fuel storage, etc. Wilson Eyre, Esq., architect, 927 Chestnut Street, Philadelphia, Pa.

Our engraving was made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.



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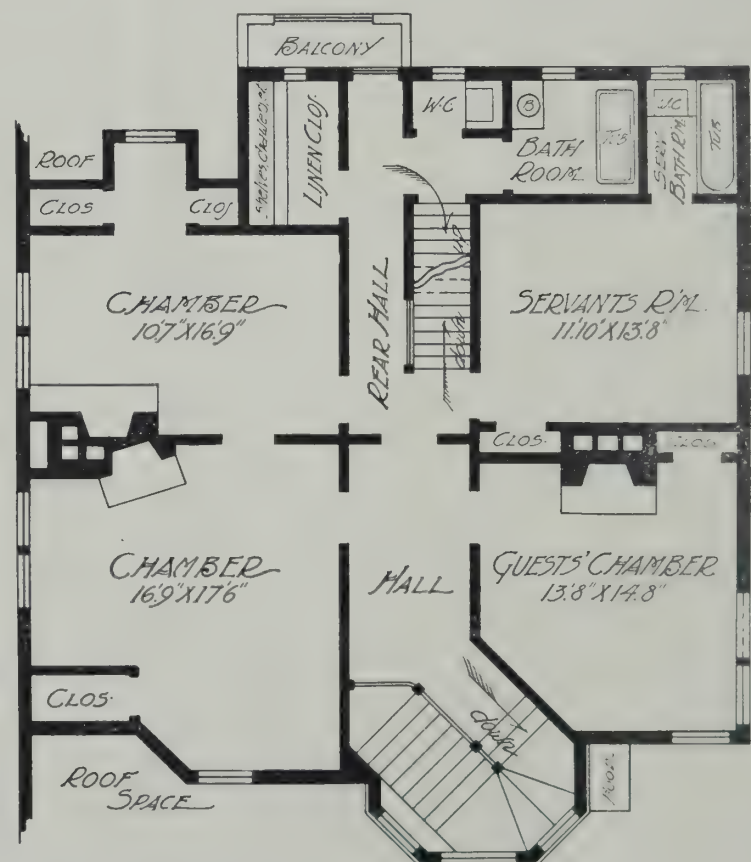
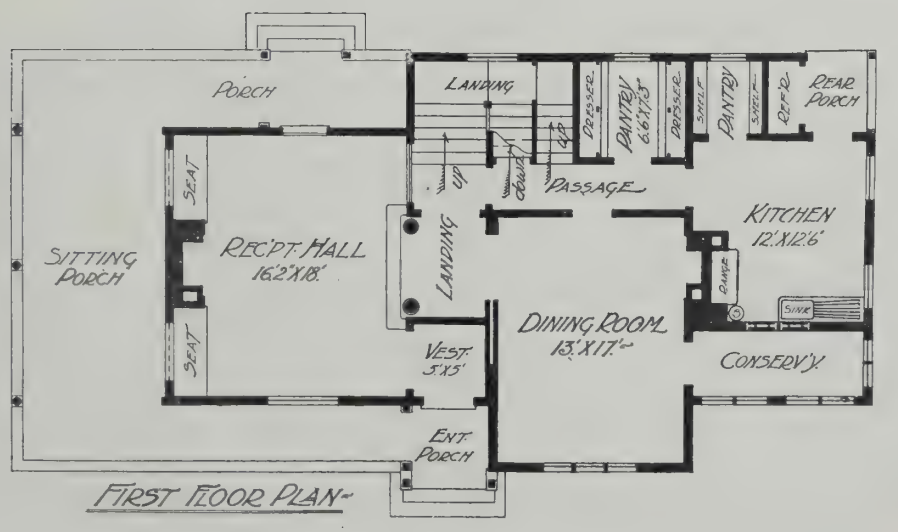


SECOND FLOOR PLAN.

RESIDENCE OF JAMES W. COCHRAN, ESQ., BALTIMORE, MD.—See page 67.



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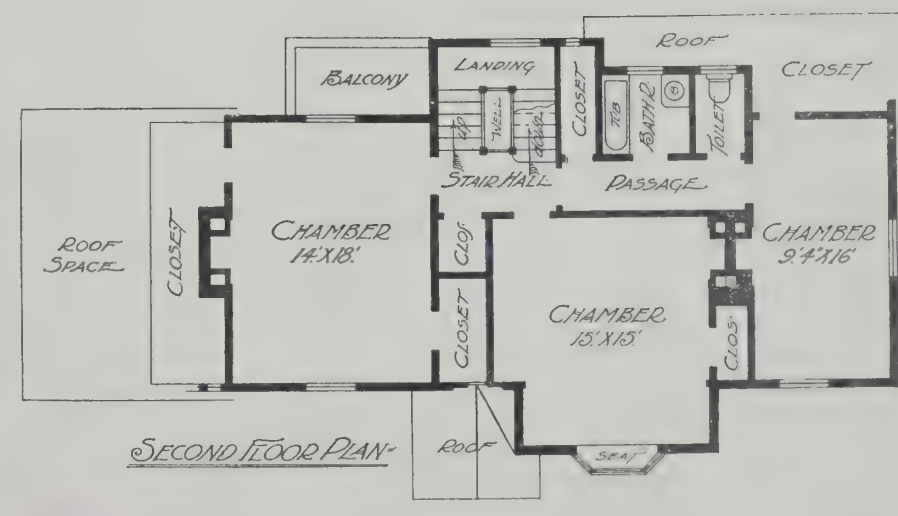

SECOND FLOOR PLAN.

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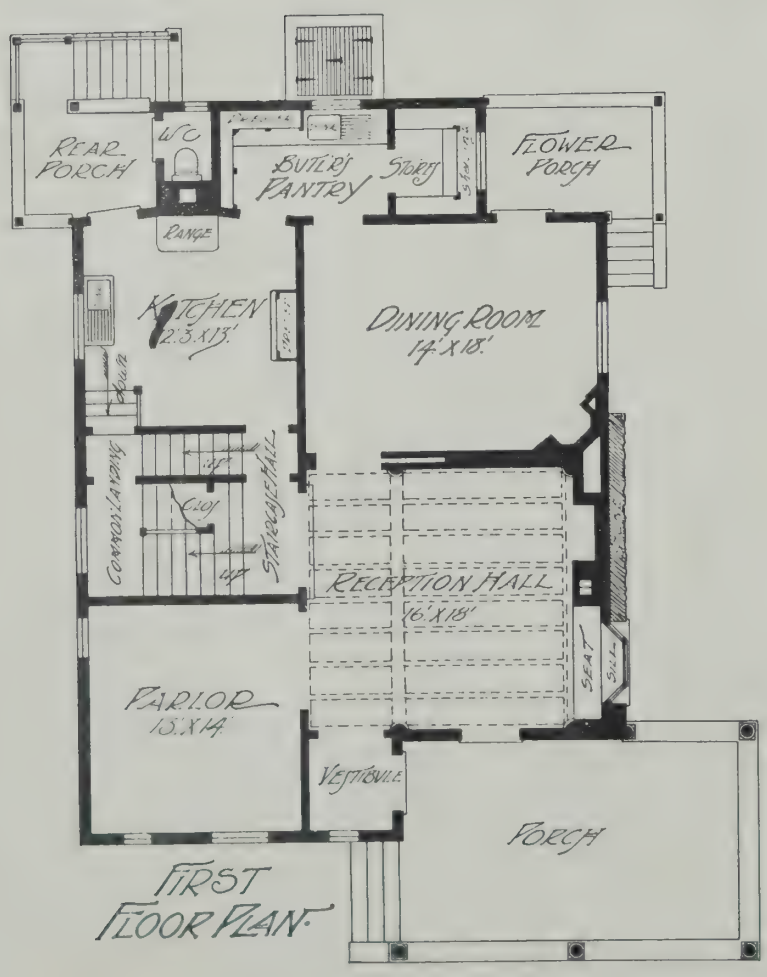
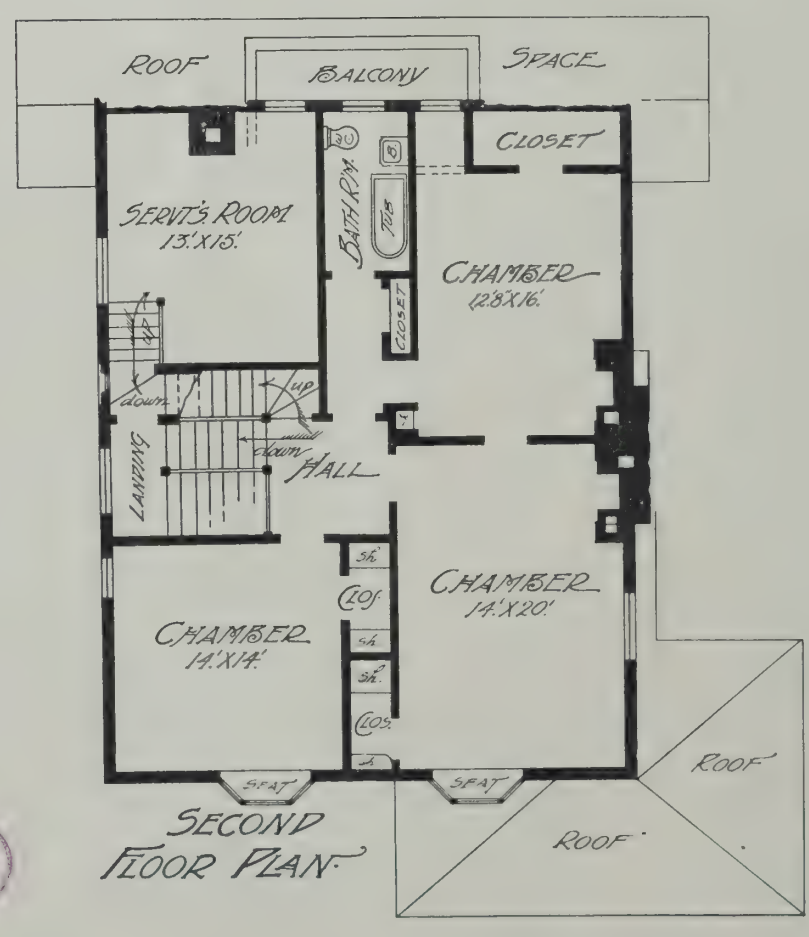
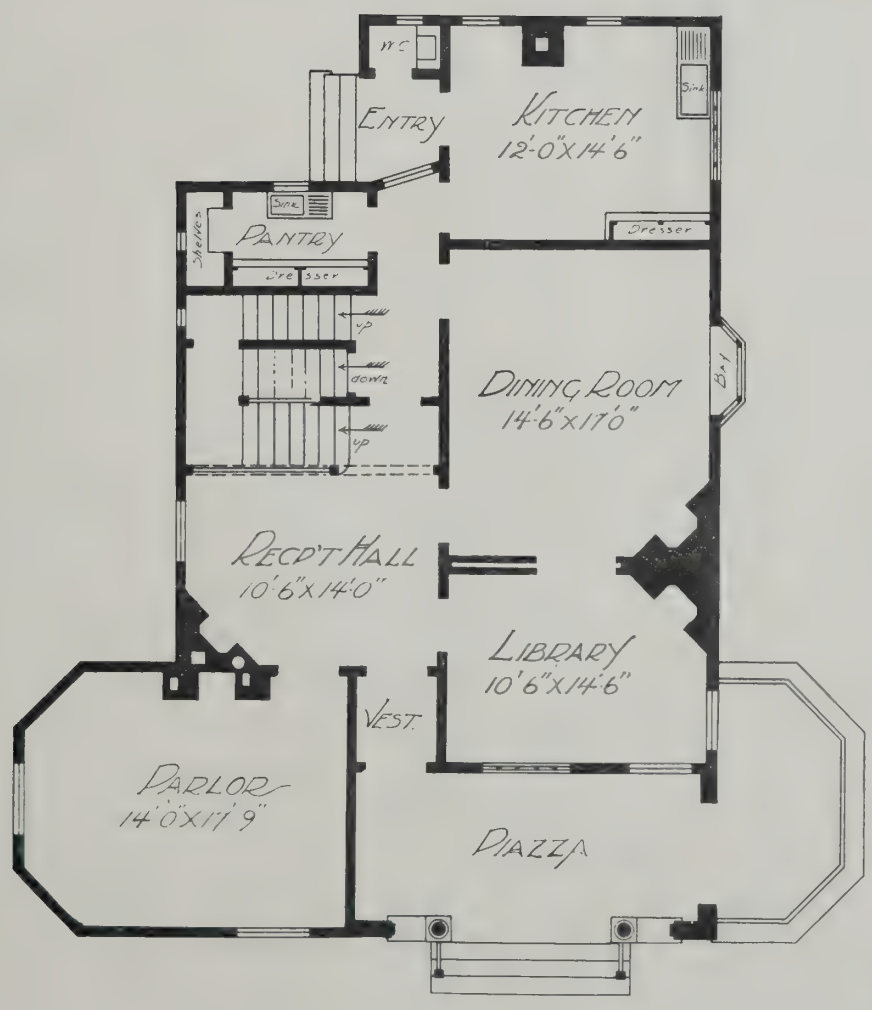
RESIDENCE OF EDWARD H. BOUTON, ESQ., ROLAND PARK.—See page 78.





MR. H. T. BEACHAM'S RESIDENCE, BALTIMORE, MD.—See page 79.



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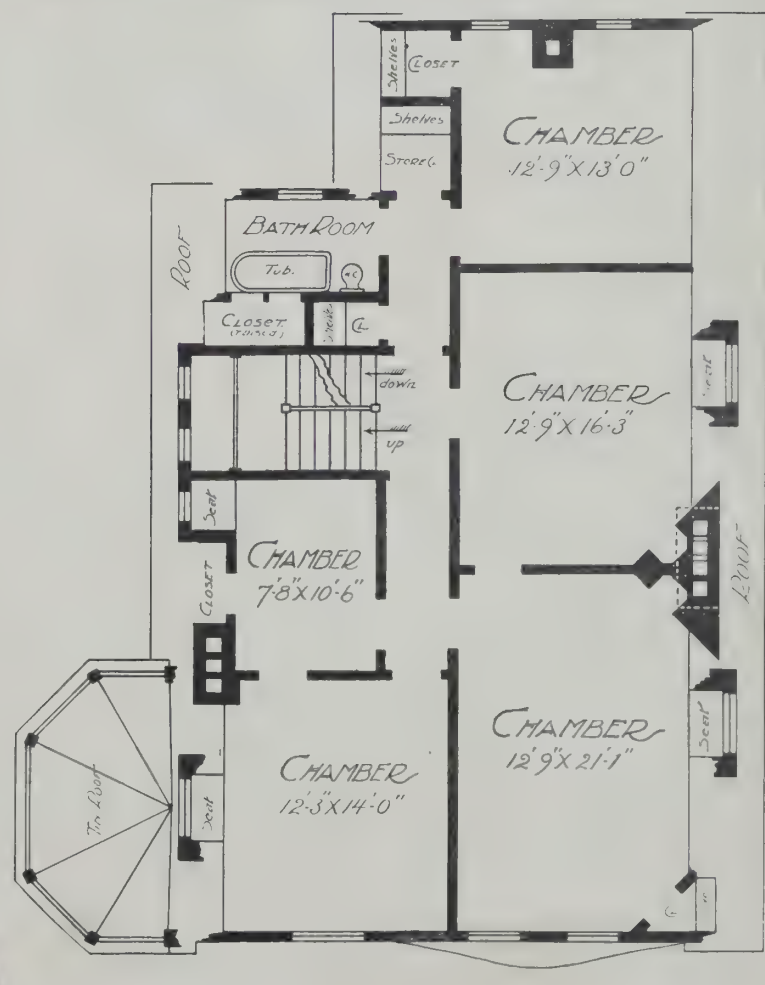

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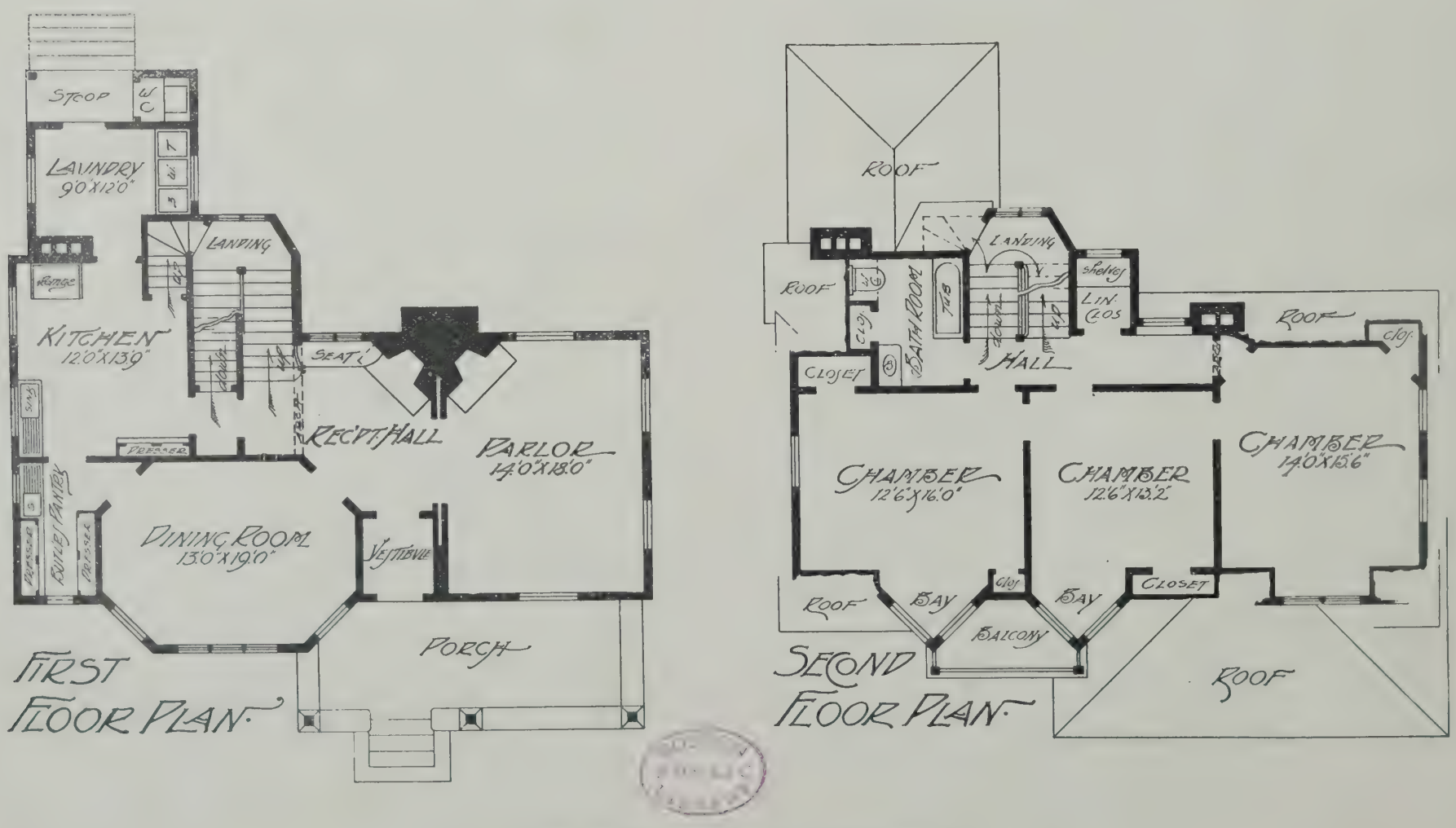
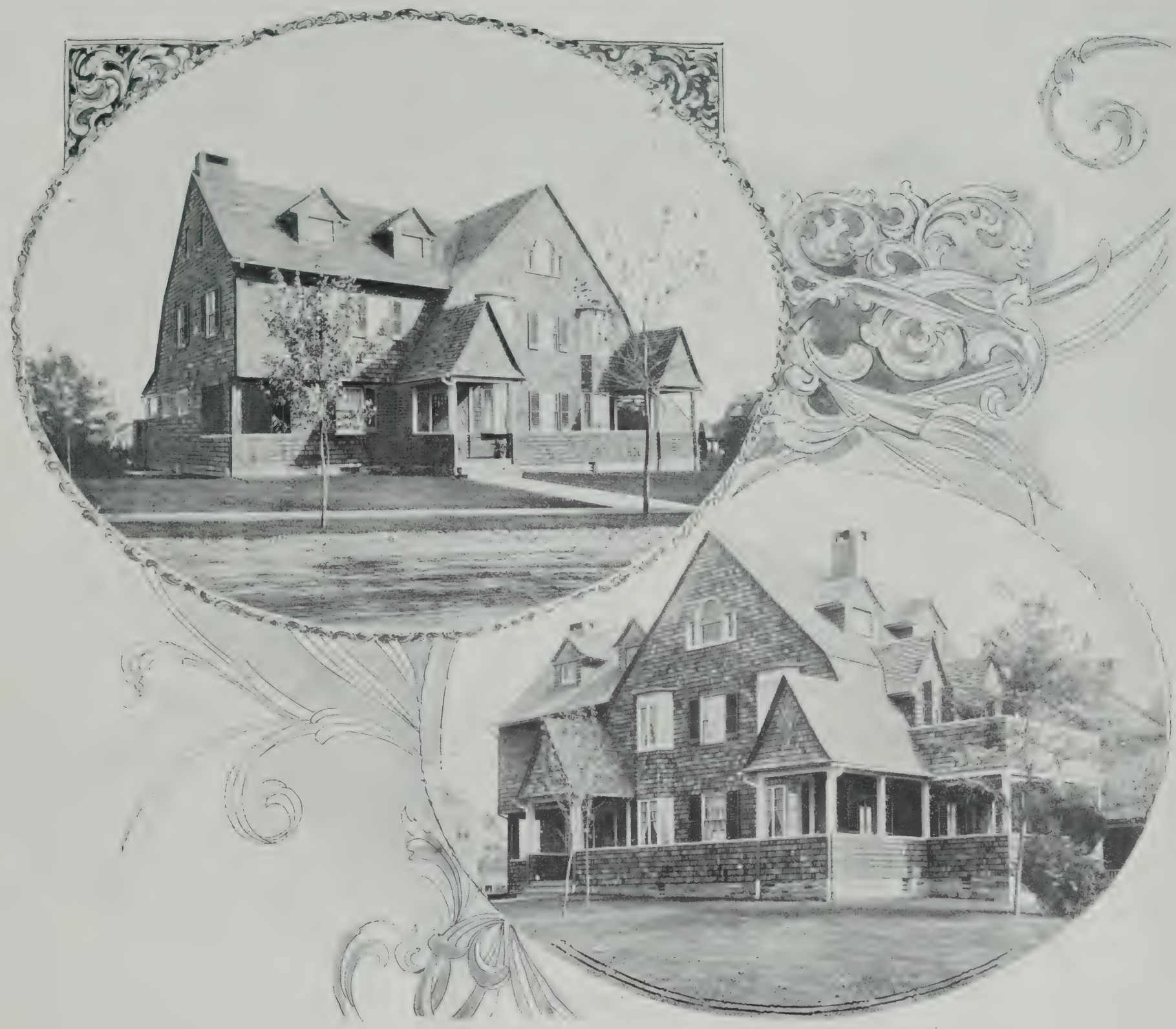
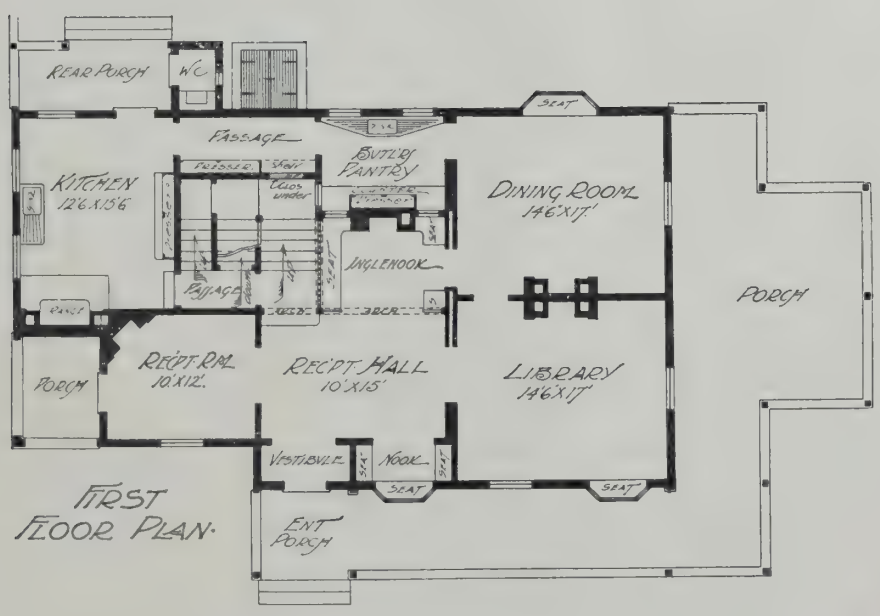
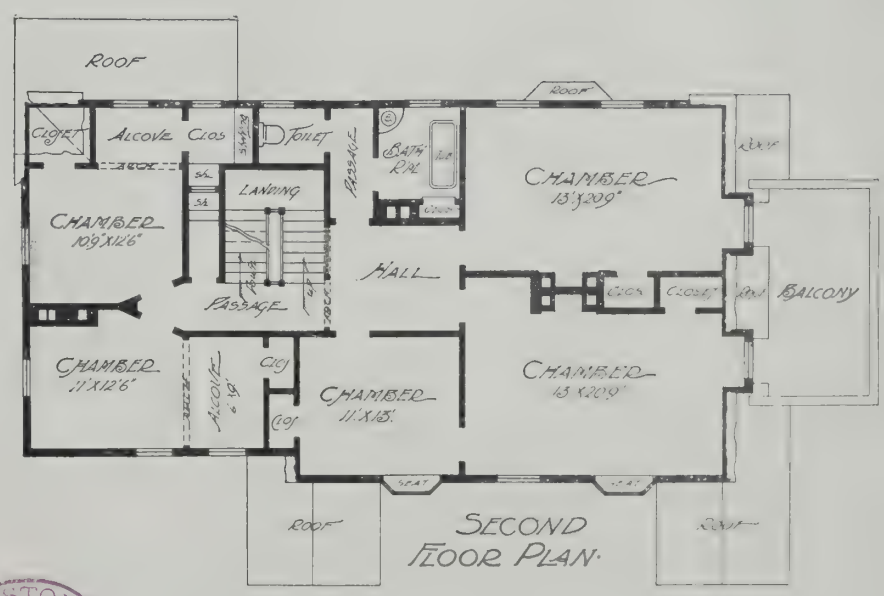
A COUNTRY HOUSE AT ROLAND PARK, MD.—See page 79.



A SUBURBAN RESIDENCE.—See page 67.







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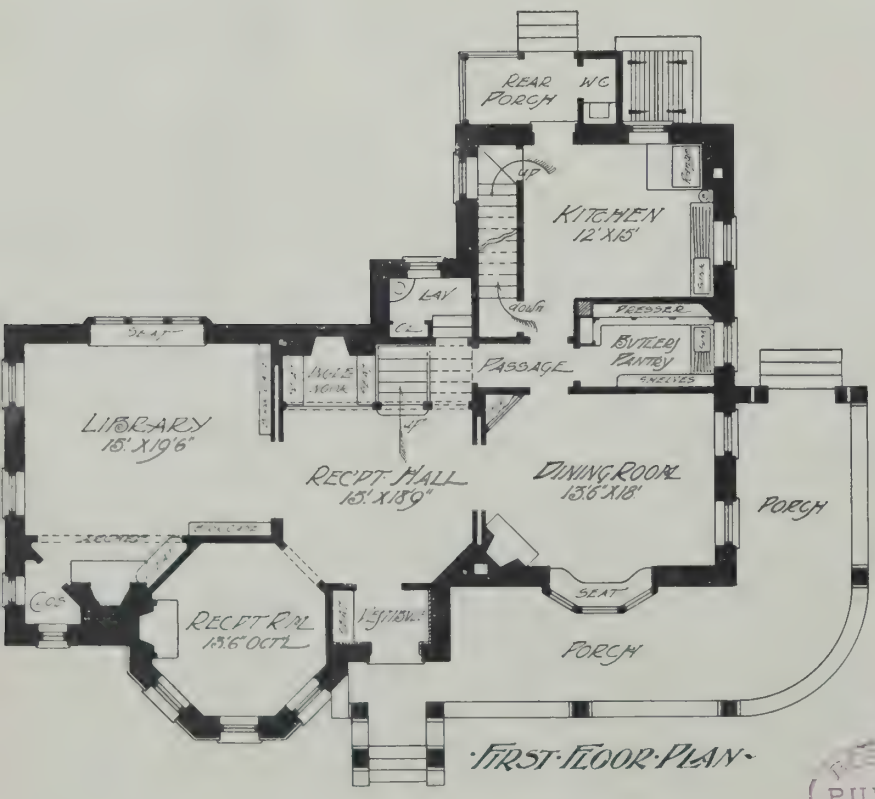
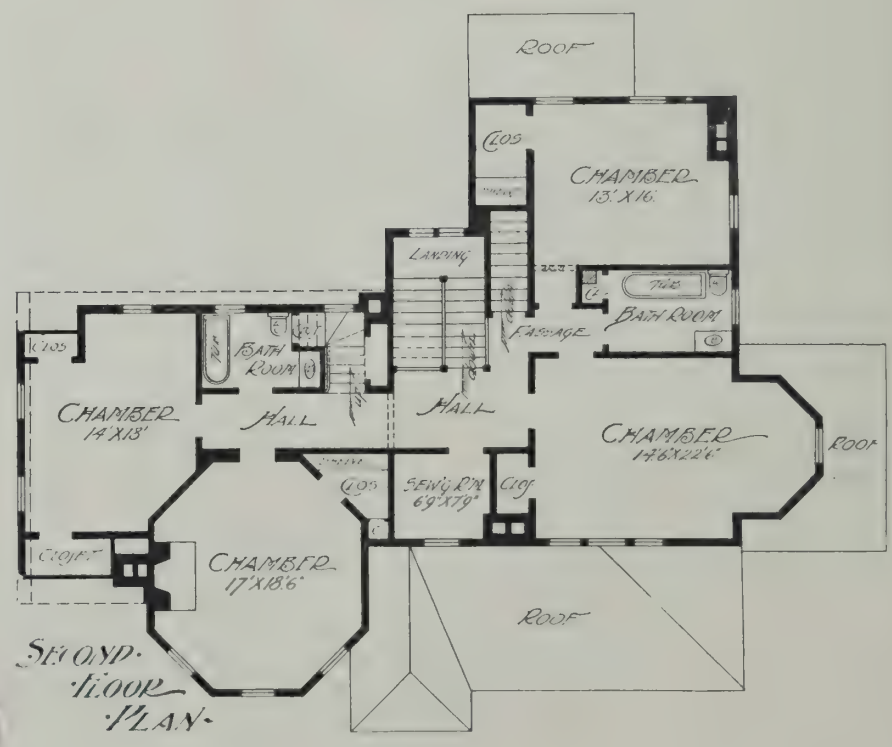
A HOUSE IN ROLAND PARK.—See page 78.





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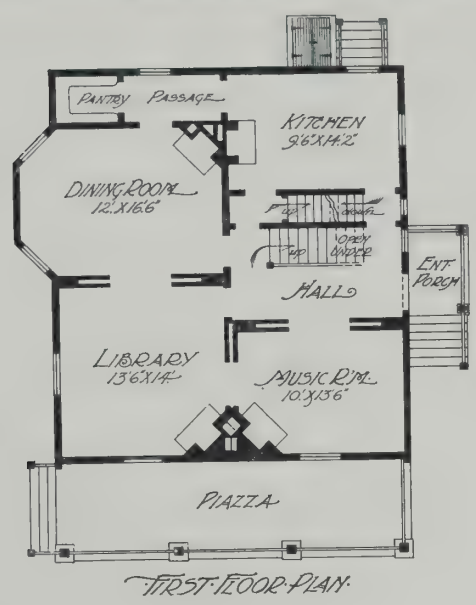

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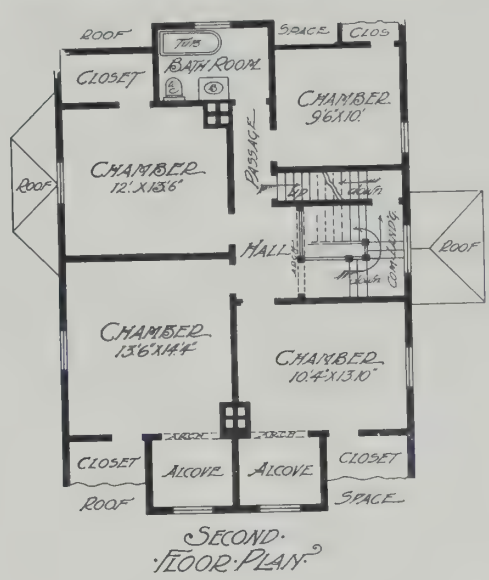

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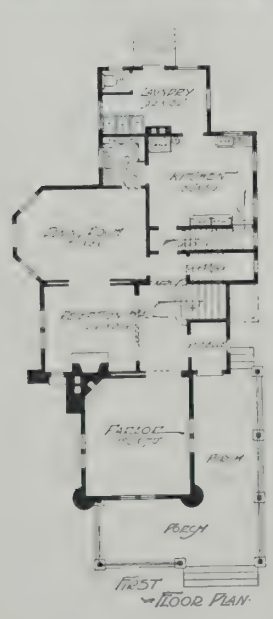
A ROLAND PARK COTTAGE —See page 79.



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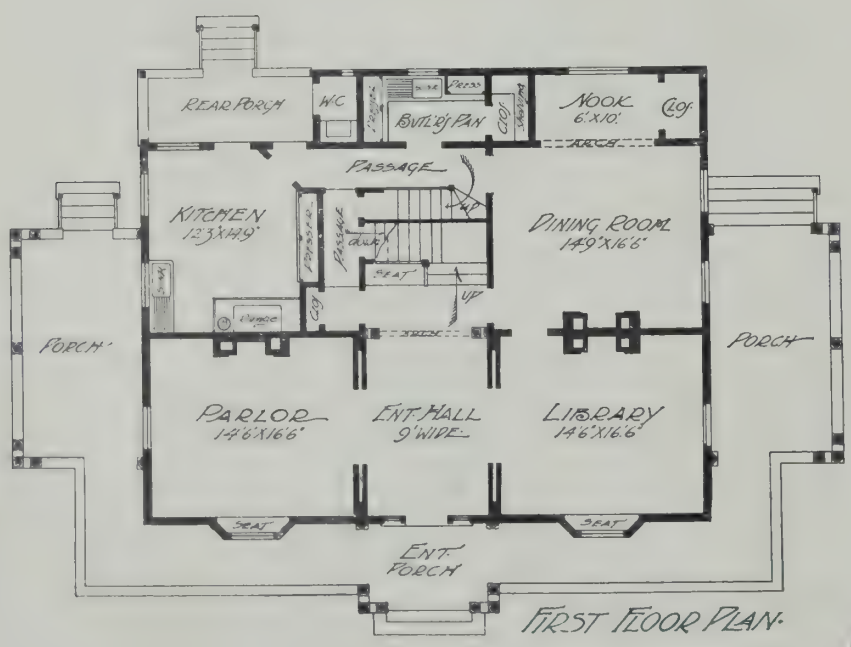
RESIDENCE OF MRS. H. B. ROSSTON, BALTIMORE, MD.—See page 79.



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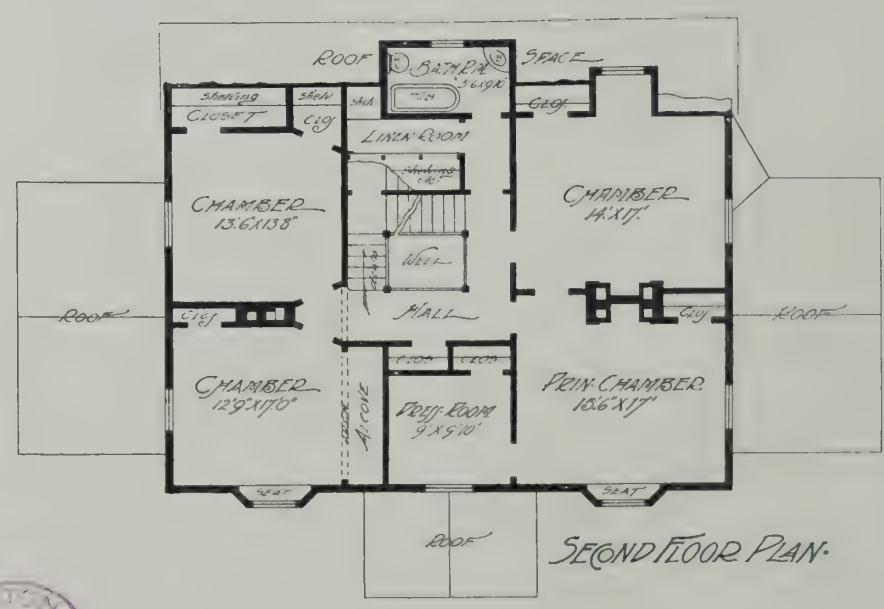

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SOME TOWN HOUSES.—See page 78.

A HOUSE IN ROLAND PARK.

On page 73 we illustrate an all-shingled house at Roland Park, Baltimore, Md , the residence of Mrs. I. C. Parlett. The design is treated in the Colonial style ; the roof lines are well broken by the frequent introduction of dormers, balconies, and projecting gables, the latter supported by square columns on shingled rail base. Underpinning of local stone ; exterior framework above sheathed, papered, shingled, and stained nut brown ; roof also shingled, and stained slightly green; trimming color, cream ; outside blinds, where used, are painted deep green ; chimneys of red brick, capped with stone. Dimensions : Front, 53 ft. 10 in.; side, 30 ft. 10 in., exclusive of porch projections. Height : Cellar, 7 ft. 10 in.; first floor, 9 ft. 3 in.; second, 8 ft. 10 in.; attic, 8 ft. Entrance through vestibule to reception hall ; walls and ceiling covered with buff cartridge paper ; nook at side, with seats and bay ; ingle-nook is a very interesting hall feature ; face of fireplace and hearth, Roman brick ; paneling above, seats at side ; spindle balusters at staircase, and square column, forming newel, to ceiling. Library with fireplace, faced with sea-green tiles ; mantel of good design over ; walls tapestried. Reception room with angle fireplace, in cream tiles, mantel over ; walls also tapestried ; trim, cypress. Dining-room walls in cartridge paper ; fireplace faced with square buff tiles, mantel over ; communicates with kitchen, containing usual fixtures, through butler's pantry, with sink, dresser, etc., and passage, with shelving and dresser at side. Second floor plan shows five chambers, the two principal ones having fireplaces, all with closets, and two others with alcoves : bathroom with best plumbing, toilet separate ; hall with balustered screen at staircase. Attic contains three bedrooms, large hall, servant's bathroom, and storage closet. Cellar, cemented, contains laundry, heater, fuel storage, and other apartments. Erected by the Roland Park Co. Messrs. Wyatt & Nölting, architects, Baltimore, Md.

Our engravings were made direct from photographs of the building, taken specially for the Scientific American.

A MODERN COTTAGE.

Our illustrations and floor plans on this page represent the residence of H. G. Austin, Esq., at Roland Park, a suburb of Baltimore, Md. The design is simply treated, detail being in Colonial style. The full width gambrel roof is broken by gabled dormer, effectively shingled ; porch rail is also shingled, and forms base for square columns supporting roof above. Underpinning of local stone ; exterior framework above sheathed, papered, shingled, and stained snuff brown; roof also shingled, and stained slightly green. Chimney of brick. Dimensions : Front, 29 ft. 8 in. ; side, 30 ft. 2 in., exclusive of porch. Height : Cellar, 7 ft. 6 in.; first floor, 9 ft.; second, 8 ft. Entrance door opens on reception hall or living room ; sliding doors to dining-room, having wide mullioned window, and direct communication with kitchen, provided with usual fixtures ; library of good size, trimmed in cypress, natural, which is the finish throughout. Second floor plan shows three chambers with large closets, linen closet with shelving, etc., and bathroom with all desirable fixtures. Cellar, cemented, contains laundry, with three wash trays, heater, and fuel bins. This house was erected by the Roland Park Company.

Our engravings were made direct from photographs of the building, taken specially for the Scientific American.

RESIDENCE OF EDWARD H. BOUTON, ESQ., ROLAND PARK.

On pages 65 and 69 we present an exterior and interior view and floor plans, illustrating an excellent residence recently erected at Roland Park, Baltimore, Md., by the owner, Edward H. Bouton, Esq., the Vice-President and General Manager of the Roland Park Company. The views show a successful treatment of an all-shingled house, in the Colonial style ; the great expanse of gambrel roof is relieved by dormers, projecting gables, and bay ; porch rail is shingled, and forms base for square columns at entrance gable ; turned columns at side support the overhanging roof above. Underpinning of local stone, gray in color, all framework above being sheathed, papered, shingled, and stained sea green at side, and allowed to weather finish at roofs. Chimneys of brick, cement capped. Dimensions : Front, 49 ft. 4 in.; side, 29 ft., including main, but not porch projection. Heights : Cellar, 7 ft.; first story, 8 ft. 9 in.; second, 8 ft.; attic, 7 ft. 6 in. Dutch sash entrance door, paneled beneath, opens on vestibule, with walls covered with cartridge paper ; portière opening to reception hall or library, with centred fireplace, faced with cream unglazed tiles, with mantel above, good Colonial design ; seat at each side, bookcases over having leaded glass doors. There are two steps up from this room to landing and dining-room level. Heavy Ionic columns, of correct detail, support the beam above. Narrow, exposed ceiling beams have ceiling strips between. Stairs, of easy rise, have four turned balusters to the tread, and turned rail. Dining-room, with walls tapestried, and similarly tiled fireplace ; two columns support the mantel shelf above. Conservatory all shingled, same as outside, by removal of sash, forming porch. Passage, with ample dresser accommodation, at side. Kitchen, with usual fixtures, is wainscoted 5 ft. high with narrow T and G boards, moulded cap and base. The second floor plan shows three chambers, with fireplaces and closets, and tiled bathroom, with best fixtures ; toilet separate ; all plumbing exposed. Attic has servant's room, servant's bath, and closet space finished off. Cellar, cemented, contains hot water heater, servant's toilet, laundry, fuel storage, and other apartments. The finish throughout is clear white pine ; in the reception hall and dining-room it is given a slight greenish tinge, by the addition of that color to the oil, making a very pleasant color effect ; kitchen and pantries are finished natural ; chambers are painted in colors to harmonize with papers. Front bay and mullioned window, as well as the two side reception hall windows, are leaded, the two former casement hung, the latter stationary. Messrs. Wyatt & Nölting, architects, Baltimore, Md.

Our engravings were made direct from photographs of the building, taken specially for the Scientific American.

A MODERN COTTAGE.

SOME TOWN HOUSES.

We present herewith, in this issue, on page 77, illustrations showing some of the new and larger town houses which have recently been erected. The first engraving on the page illustrates a group of houses erected for Henry Villard, Esq., at Madison Avenue, Fiftieth and Fifty-first streets. This engraving presents a unique group of dwellings, surrounding a court and driveway. The illustration presents one house on either corner, with the court between same, while at the rear of this court will be found two more dwellings facing the avenue. These centre houses have a colonnaded entrance. It is a most unique example of its kind, and is one that could be duplicated with equally satisfactory results. This pile is in many respects the most palatial structure in the city. It is treated in the Roman style of Italian renaissance of about the time of Bramante. It is rather severe in treatment, but carries out the style of architecture of that period. It is built of brownstone rock from the Newark, N. J., quarries, and is built entirely of masonry and iron throughout. Mr. Stamford White, of McKim, Mead & White, 160 Fifth Avenue, was the architect. The second engraving presents the residence of John Jacob Astor, Esq., on Fifth Avenue. This building was erected from the late Mr. Hunt's designs, who has been the author of many works of domestic architecture that have proven most successful. The style of

treatment descends from the early French renaissance, with Italian feeling, and it gives strong horizontal members for keeping the building down, and which is so successfully managed that one would believe the frontage was even greater in length than the actual 125 feet. There is a lack of ornamentation in the whole composition, and the most conspicuous feature is the dormer windows, but this even is not the most striking feature, as the long flank at street side, where the corbeled turrets with the triple arcade below and the triple dormers above present a new, picturesque, and effective feature. One feature of this building that is subject to criticism is the canopy of iron over the front entrance, which seems massive and ungainly. However, the whole treatment is most excellent, and, aside from this, it presents a dignified and stately appearance. The other and last engraving illustrates the residence of Elbridge T. Gerry, Esq., and is one of the most interesting and successful of the late town houses erected on Fifth Avenue. It was also executed from designs prepared by Mr. R. M. Hunt, and is treated in the early French renaissance style of architecture, with Gothic detail. The nucleus of the composition is the square, tower-like mass, with its steep roof at corner, to which all the subordinate parts pyramidize. The strength of the tower is enhanced by the arrangement and treatment of its openings and by the power of the crowning roof. The encircled dormer windows also give it a touch of grace and lightness where it is needed. The decorated loggia, with its corbeled balcony and the doubled window beneath it, is a most artistic feature. The design is peculiar in some respects, and is not fully appreciated for the reason that upon passing in front one would notice some detail that is beautiful and clever, but, as his eyes rested upon the peak, he would then feel that it was one-sided and top-heavy; but if he would take the point of view as intended by the architect to show its expression, and the perspective view which we show in the illustration, he would find that the completeness as a whole, and the variety of effect, is that which the architect aimed at, and which he has attained.

The engravings were made direct from photographs of the buildings, taken specially for the SCIENTIFIC AMERICAN.

RESIDENCE OF M. B. SAYRE, ESQ., NEAR BALTIMORE, MD.

The subject of illustration on page 74 is the residence of M. B. Sayre, Esq., at Roland Park, Baltimore, Md. The design is domestic Gothic in feeling, the octagonal tower breaking through the great expanse of gable roof, well shaded porch, roof being supported by stone piers, hipped entrance feature and general grouping of windows, are the principal exterior features. Underpinning and first story of rock faced, light gray stone; exterior framework above sheathed, papered, shingled, and stained deep red; roof also shingled and left to weather. Trimming color, cream; blinds at stone work, same; other painted green. Chimneys of red brick, recessed face, and corbeled top. Dimensions: Front, 57 ft. 6 in.; side, 36 ft., not including bay or porch projections. Height: Cellar, 7 ft. 6 in.; first story, 9 ft.; second, 8 ft. 6 in.; attic, 7 ft. 6 in. Floor plans show a most convenient arrangement of rooms; entrance door, sash above, and paneled beneath, to vestibule, having seat at side, and door to reception hall, wainscoted, ceiling plastered and paneled off, beams being exposed; square column at stairs, with beam forming flat arch over inglenook. The fireplace is faced with light buff brick, mantel shelf above, and paneling to ceiling; seats at each side. Reception room in tower, octagonal in form, is in pine, painted cream; low paneled wainscot or dado; fireplace, faced with cream tiles, has Colonial mantel above. The library, in dark oak, has fireplace, faced with large burnt Sienna tiles, mantel shelf above, and paneled to ceiling; seat at one angle, closet in other; seat at mullioned window; beam over bookcases at blank wall. Dining-room, also in oak, has seat in bay, fireplace faced with blue tiles, with shelf and dresser above in one angle, china closet in other. Butler's pantry has generous dresser room, sink and shelves. Kitchen contains usual fixtures. Second floor divided into four chambers, all with large closets, sewing and bath room, with best fixtures and exposed plumbing. Servant's apartment and storage space in attic. Cellar, cemented, contains laundry, heating apparatus, fuel storage, and other apartments. W. L Price, Esq., architect, 731 Walnut Street, Philadelphia, Pa.

Our engravings were made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.

A ROLAND PARK COTTAGE.

We illustrate on page 75 a cottage at Roland Park, a suburb of Baltimore, Md., designed by the owner, James F. Leib, Esq. The views show a front piazza, with four stone piers to height of rail, forming base for square columns supporting the overhanging gable roof, which is relieved by the wide, hipped-roof dormers in front and rear. Underpinning and piers, of local stone; structure above sheathed, papered, clapboarded, and painted yellow at first story; gable shingled and stained brown; roof also shingled, and left to weather; chimneys of brick, capped with stone. Dimensions: Front, 29 ft., exclusive of entrance porch; side, 40 ft., including piazza. Height: Cellar, 6 ft. 6 in.; first story, 9 ft.; second, 8 ft. 6 in.; attic, 7 ft. The entrance porch at side, with door opening on hall, in white pine, grained oak; staircase has wide newels, with paneled faces and flat cap; turned balusters on straight string; sliding door opening to music-room, in pine, painted white, with angle fireplace, faced with light-gray mottled tiles; mantel, also painted, has ornamental top and beveled mirror. Library connects by sliding doors; similar fireplace, with tiles of light mottled brown, mantel above, mirror backed. This room also has glazed door to front piazza, and really serves purpose of reception hall or living room. Dining-room has fireplace, also tiled; upper mantel shelf is supported by two long fluted columns; two shorter ones support the side shelves; beveled mirror head. Passage, with pantry at side, leads to kitchen. A wide, circular arch, with large, central electric light globe, forms interesting feature in second floor hall. This floor is divided off into four chambers of good size, two with alcoves (circular plaster arches), and all with large closets; also bathroom, wainscoted in yellow pine, natural; all plumbing being exposed and nickel-plated, tub of enameled iron, basin of marble; all best make; two rooms in attic; house is trimmed throughout in white pine, grained or painted, lighted by electricity and gas, heated by hot air, and cost complete $3,500; cellar, cemented, contains heater, fuel storage, etc.

Our engravings were made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.

A COUNTRY HOUSE AT ROLAND PARK, MD.

Our illustration on page 71 represents a Colonial residence, embracing both symmetry of design and convenience of arrangement. The piazza is cozily sheltered and of inviting appearance, with Tuscan columns and pilaster at shingled jambs. The bay at side gives ease to and relieves the severity of roof lines. Shingles on roof are weathered, and on side stained snuff brown. Trimmings of cream color, contrasted by dark green blinds. Chimney of red brick, with bluestone coping. Dimensions: Front, exclusive of bay, 30 ft. 2 in.; side, 51 ft. 4 in. Heights: Cellar, 8 ft. 6 in.; first story, 10 ft. 3 in.; second story, 9 ft. 7 in.; attic, 7 ft. 6 in. On the first floor we have an attractive reception hall, paneled in cypress; staircase having spindle balusters reaching to under side of flat arch adorning ceiling. The angle fireplace paneled. Back stairs conveniently connecting with main staircase at the landing. The library contains angular fireplace, with marble mantel supported by two brackets. Dining-room in white, with ornamental frieze, also containing cheerful fireplace of neat design. The kitchen and pantry each provided with dresser with drawers under shelves. In attic there is one large bedroom, a servant's bedroom, and convenient storage accommodations. The owner is John W. McPherson, Esq., 415 Sheldon Avenue. Architects, Wyatt & Nölting, 301 N. Charles street, Baltimore, Md.

Our engravings were made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.

RESIDENCE OF MRS. H. B. ROSSTON, BALTIMORE, MD.

We illustrate on page 75 the residence of Mrs. H. B. Rosston, at Roland Park, Baltimore, Md. The views show a design appropriate to its surroundings, the broad treatment of roof and gable ends being the principal features of the design. There is a wide, well shaded porch, with square columns on stone piers, supporting the high hipped and overhanging gable roofs. Underpinning, portion of first story, and main chimney of rock-faced local stone, laid with joints well broken and with good color effect; other chimneys of brick, stone capped. All exterior framework sheathed, covered with building paper, shingled, and stained deep red; roof similarly treated. Dimensions: Front, 31 ft. 3 in., exclusive of bay; side, 62 ft. 7 in., not including porch projections. Heights: Cellar, 7 ft. 6 in.; first story, 9 ft.; second story, 8 ft. 6 in.; attic, 7 ft. 6 in. The reception hall, running full width of house and finished in red oak, has wide arched opening, forming separating feature from staircase portion fireplace centred, faced with tiles, mantel over. Wide staircase of easy rise, turned balusters and plain square newel, leaded landing window; walls papered. Parlor also has tiled (angle) fireplace, mantel of neat design above, connects by sliding doors. Dining-room, finished natural, has double sliding door opening, bay full width, and connects with kitchen, containing usual fixtures, through pantry, provided with dressers, sink, etc. Laundry in rear has three wash trays. Second floor divided into four chambers, the connecting one intended for dressing room, and bathroom, with plumbing exposed and approved fixtures. Large linen closet, provided with shelves, etc. Attic, servants' rooms and storage space. Cellar, cemented, provided with heating apparatus, fuel storage space, etc. Built by the Roland Park Co. W. L. Price, architect, 731 Walnut street, Philadelphia, Pa.

Our engravings were made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.

MR. H. T. BEACHAM'S RESIDENCE, BALTIMORE, MD.

We illustrate on page 70 the residence of H. T. Beacham, Esq., at Roland Park, Baltimore, Md. The views show an exterior simple in treatment and tasteful in design, the severe lines of walls and roof being broken only by the two projecting bays, windows, dormers, and the rear balcony. The front entrance porch, with stone wall and Tuscan columns supporting the high hipped roof above, forms a desirable corner feature. Underpinning, porch, wall, and main chimney of rock-faced local stone, laid at random. Exterior framework above sheathed, papered, shingled, and allowed to weather finish; roof treated similarly. Trimming color, light Colonial yellow, olive green blinds. Dimensions: Front, 33 ft.; side, 45 ft. 7 in., exclusive of front porch projection. Heights: Cellar, 7 ft. 6 in.; first story, 9 ft. 6 in.; second story, 9 ft.; attic, 8 ft. 6 in. Dutch entrance door, painted green, has single lower panel, upper portion glazed and divided into small squares, by wooden muntons, opens into vestibule. Reception hall (cypress) of good size, having ceiling beams exposed, corner fireplace, with arched opening, faced with light brick, paneling to ceiling; seat at side, also paneled, with small bay over, glazed with leaded glass; walls covered with buff cartridge paper; flat arch to staircase, of same wood, square newels and balusters. Parlor connects by wide opening; trim, tinted pine. Dining-room also in cypress, walls covered with cartridge paper; has angle fireplace, faced with buff unglazed tiles: having ornate mantel over. This room connects with kitchen, containing usual fixtures, through butler's pantry, with ample dresser space and sink. Store room to right. Second floor plan shows four chambers, one being servant's room, and bath room with usual fixtures; plumbing, etc., of the best. Attic has hall, billiard room or studio, and one servant's room finished off, still allowing generous storage space. Trim, where not otherwise noted, usually white pine. Cellar, cemented, contains hot water heating apparatus, laundry, fuel storage, etc. Messrs. Wyatt & Nölting, architects, Baltimore, Maryland.

Our engravings were made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.

Humidity in Dwellings.

It being granted that humidity in dwellings is the cause of many diseases, the following simple method of testing, which has been suggested by the Lyon Medical, is interesting. It directs that doors and windows of the room must be closed to prevent the entrance of exterior air, and that a piece of fresh quicklime should be left in the room for twenty-four hours. It claims that in an ordinary room, if three-quarters of an ounce of water is absorbed by the lime, the room may be considered unhealthy. The amount absorbed is determined, of course, by weighing the lime. Our authority, unfortunately, fails to state the size of the room.

IN the King Building, at the corner of Milk and Broad Streets, Boston, the architect, William Whitney Lewis, having to build an iron staircase of several flights, and not wishing to use marble or slate treads on account of the comparatively large expense of the same, and the more or less slippery quality of these materials after a little use, decided to have the iron treads made in shallow pan shape, with ribs spaced about 2½ inches apart in both directions with the tops of the ribs about one-fourth below the rims of the pans; the pans were then filled with equal parts of best Portland cement and sharp sand, troweled down to a smooth surface. The treads thus made promise to be durable, are almost noiseless, afford a firm foothold, and can be easily and quickly repaired or patched in case of wear or injury by accident; in case of wear in the middle of width of tread, only so much of tread as is worn down need be replaced; a marble or slate tread would, of course, have to be replaced with a full-sized tread.—*The Brickbuilder.*

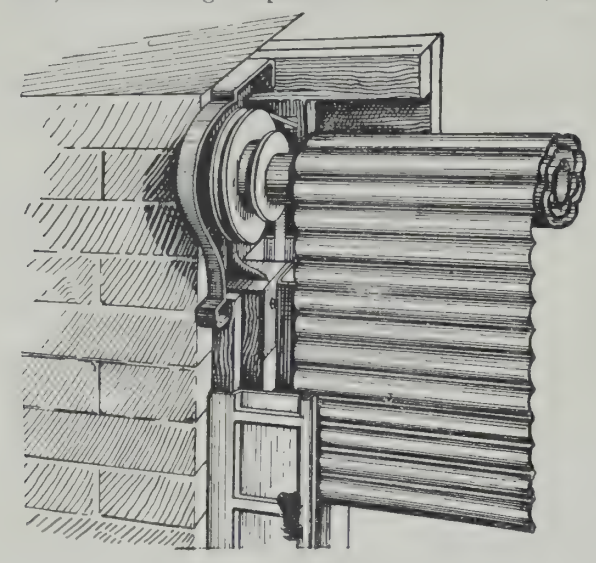
A SHELF over the door in a dining-room is an excellent place for large and highly colored pieces of china, which may thus be made very ornamental to the room. Many of the new houses are finished with a narrow shelf around the dining-room walls at the height of the door; it is intended for plaques.

PICTURESQUE COTTAGES, price fifty cents, by E. E. Holman, 1020 Chestnut Street, Philadelphia, is a book of beautiful designs of small houses, costing from $300 to $1,500. It gives perspectives of homes which are pleasing and restful to the eye, with descriptions and estimates, prices of labor and material, etc. The author is an architect, and makes plans, details, and specifications for dwelling houses and stables.

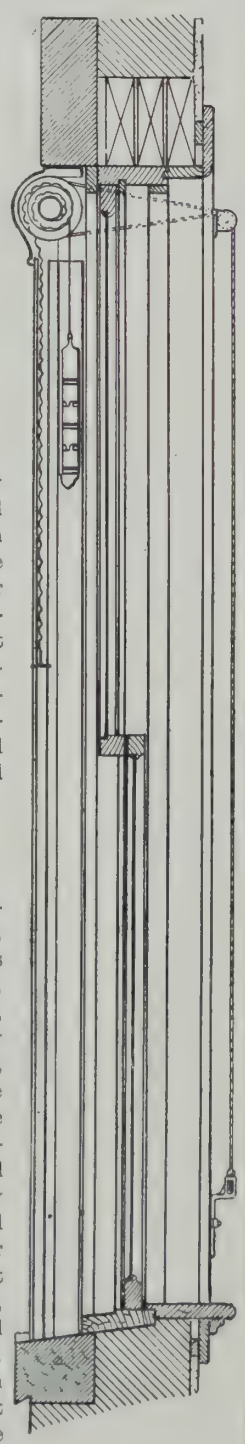
A SIMPLE disinfectant to use in a sick room is made by putting some ground coffee in a saucer, and in the centre a small piece of camphor gum. Light the gum with a match. As the gum burns allow the coffee to burn with it. The perfume is refreshing and healthful, as well as inexpensive.

A NEW ROLLING STEEL DOOR AND SHUTTERS.

The latest thing in the way of a rolling steel door has just been brought out by the Kinnear & Gager Company, of Columbus, Ohio. Mr. W. R. Kinnear, the President of the company, is the inventor. The door is composed of a series of steel slats, ingeniously hooked together, the width of each being two inches. This is attached to a metal roller at the top, and is always kept in balance at any position by an equalizing weight. The curtain travels in a groove on each side of the opening, and is operated by a small rope on the inside of the building, or it can be raised or lowered on the outside by pushing up or pulling down the curtain itself. The slats are made of heavy No. 22 steel, each one being a duplicate of the other in form, and



they can be furnished of any length up to 200 ft. in one piece, if desired. The improvement is also used for partitions. Groups of shutters can be operated at one time, if desired, and can be raised or lowered from the first floor of the building.



The Kinnear & Gager Company will soon have a double rolling steel shutter, running up and down in separate grooves, and both on the same roller, and forming an air space between the two steel curtains, which, for protection against fire, will be invaluable. The company publish an interesting catalogue, devoted exclusively to rolling steel doors and shutters, and partitions, and their new paneled steel fire doors and shutters.

Roofing Slates.

John Galt & Sons, of 253 Broadway, New York City, and Bangor, Pa., miners and wholesale dealers in all kinds of slates for roofing, issue a most instructive pamphlet, "Small Talk on Slate," which they will gladly send to all interested, on the different varieties of slate and their relative values, the proper manner of laying, estimating cost, etc. The slate quarried at Bangor, where the quarry office of the firm is located, is said to have had the reputation for many years of being the best medium priced slate in the world, making a very handsome and practically indestructible roof. One of the members of the firm is at the quarries daily to inspect the slate coming out, and all the special grades of slate are stamped, in addition to being accompanied by a certificate stating its quality and the quarry from which it comes.

Do not wash oilcloths or linoleum with hot soapsuds. Wash them with tepid water, and wipe with a cloth dampened with equal parts of cold milk and water.

A NEW CROSS-CUT SAW.

The National Saw Company, Newark, N. J., operating four of the largest saw manufacturing establishments in the world, are now making the cross-cut saw represented in the engraving, which is an improved form of the old and well-known "Champion" saw. For a number of years it has been the aim of saw manufacturers generally to produce a cross-cut saw that would retain the same thickness on tooth from the end of the saw, no matter how much the saw was filed down by the process of sharpening, and the desired result has been obtained in the saw we show. With this new process of grinding, the saw, we are assured, is left so stiff, that, no matter how much it may be filed, one man can use and work it with ease. A new steel styled the "Hercules," manufactured by the company, is used in this saw.

OUR NEW MODEL
UP TO DATE
CHAMPION
This saw is made of our superior Hercules Steel, and is fully warranted
Manufactured by the National Saw Company

NEW MODEL "CHAMPION" CROSS-CUT SAW.

A NEW DOOR HANGER.

The accompanying cut shows a new hanger, Lane's Special No. 50, which is about to be introduced to the trade by Messrs. Lane Brothers, of Poughkeepsie, N. Y. The frame is of steel, quite similar in shape to the original Lane steel hanger. It has a complete cover, having the two sides bolted together, with sleeve between, which greatly strengthens that part of the hanger. Inside the wheel and around the sleeve are the steel rollers, as shown in the cut. With this construction there is rolling friction only, and not merely reduced friction, as is the case with so many so-called long distance anti-friction hangers. The new goods are well recommended, and fully guaranteed by the makers.

ARCHITECTURAL steel, metal work, and statuary are but seldom so finely illustrated, and in such a large variety of work, as may be found in the large and very handsome folio catalogue, just issued, of W. H. Mullins, of Salem, Ohio. The subjects show art metal work of the very highest class, some illustrations of which have been already presented in our columns, and the illustrations of statuary, especially, made from photographs of the finished work, show every detail of the finest modeled and best finished work. In other lines, also, the work is of the highest order, and an architect or builder looking for a highly ornamental, practical, and durable roof finish will do well to examine the art metal tiles here shown.

WINDOW SCREEN AND SCREEN DOOR.

WARMING A ROOM WITH A GAS BURNER.

For warming rooms with ordinary gas fittings, the Suvio Heater Company, of No 116 Havemeyer Building, New York, manufacture a special form of gas heater or fire globe. It can be put on or taken off the burner in the same way as an ordinary gas globe, and consists of a globe chamber, made of steel, copper, brass, or fireproof porcelain, which converts the flame into a powerful Bunsen burner, adapted to warm a room in a short time. A central tube in the globe rises nearly to the top of the chamber, and as the gas passes up it takes with it many times its volume of air, the mixed gases, subjected to

THE SUVIO FIRE GLOBE GAS HEATER.

a fierce heat, being forced through a circle of small burners near the bottom of the globe. The device is economical and efficient. No odor is emitted, and no extra fittings are required.

Testing Corrugated Steel Arches.

The Cincinnati Corrugating Company, of Piqua, Ohio, have recently been making a large number of tests to ascertain the strength of corrugated metal arches, a subject of interest to all architects and builders, as these arches combine lightness, durability, and fireproof qualities, with low cost, in such way as to make their use very desirable wherever possible. The tests were made at the request of architects and civil engineers, and the results are embodied in a special arch catalogue, for which those interested should apply.

MULLER & MANN'S rust-proof paints, manufactured by Edmund Muller & Mann, Charlottenburg, Germany, are prepared specially for the protection of all exposed ironwork, such as iron structures, roofs, pipes, shutters, tanks, railings, etc. They have been used in Europe for a number of years with the very best of results. The fact that they are extensively used by gas works, mines, dye works, and chemical works, and by establishments where the ironwork is exposed to gases and fumes of acids, goes to show that their durability is extraordinary, and that they are a most excellent coating for exposed iron. Muller & Mann's rust-proof paints are also used by railway companies for car roofs and car trucks, by paper mills, steel works, and by the departments of public works of a number of European cities. These paints are put up ready mixed for use, ground in oil, and come in a number of different shades, including black, white, gray, red, brown, and yellow. They are not a quick drying paint, but in time become hard as stone. They will not peel nor blister, and they stand heat and cold, dampness, smoke, steam, gases, and fumes of certain acids. Otto Goetze, sole agent, 21 Whitehall St., New York, N. Y.

SCREENS FOR DOORS AND WINDOWS.

The A. J. Phillips Company, of Fenton, Mich., have a large, well equipped factory, for the manufacture of screen doors, adjustable window screens, window screen frames, etc., and their product is known throughout the country. The illustration represents one of several styles of suburban screen doors made by them, also a surburban pattern window screen which can be used either inside or outside. It is a sliding screen for use at either top or bottom of the window, and is easily removable by pushing to one side. The firm mail to applicants a neat illustrated catalogue, and also send cuttings of wire cloth and wood, showing the different finishes, to those who contemplate purchasing.

THE Goetz Box-Anchor Company, of New Albany, Ind., make the Goetz joist hangers, and are the proprietors of the Goetz & Mitchell patents covering box anchors, post caps, and joist hangers. Mr. Henry A. Goetz, president and manager of the company, offers to deposit $200 as a prize for competition by clubs or leagues in the making of the best plan of a warehouse, four or five stories high, on the slow-burning principle, in which durability, strength, arrangement of material, and the fire hazard shall be the principal features, rather than ornamental design. Those interested may write Mr. Goetz for further particulars.

IN filling cracks in plaster, mix plaster of Paris with vinegar instead of water. It will be like a mass of putty. Push it into the cracks, and smooth off with an old case knife. The plaster will not become hard for half an hour if mixed with vinegar, but if water is used it will become hard immediately, almost before you have time to use it.

To stain wood to look like ebony, take a solution of sulphate of iron, and wash the wood over twice. When the wood becomes dry, apply two or three coats of a strong decoction of logwood. Wipe the wood dry, and polish with a flannel wet in linseed oil.

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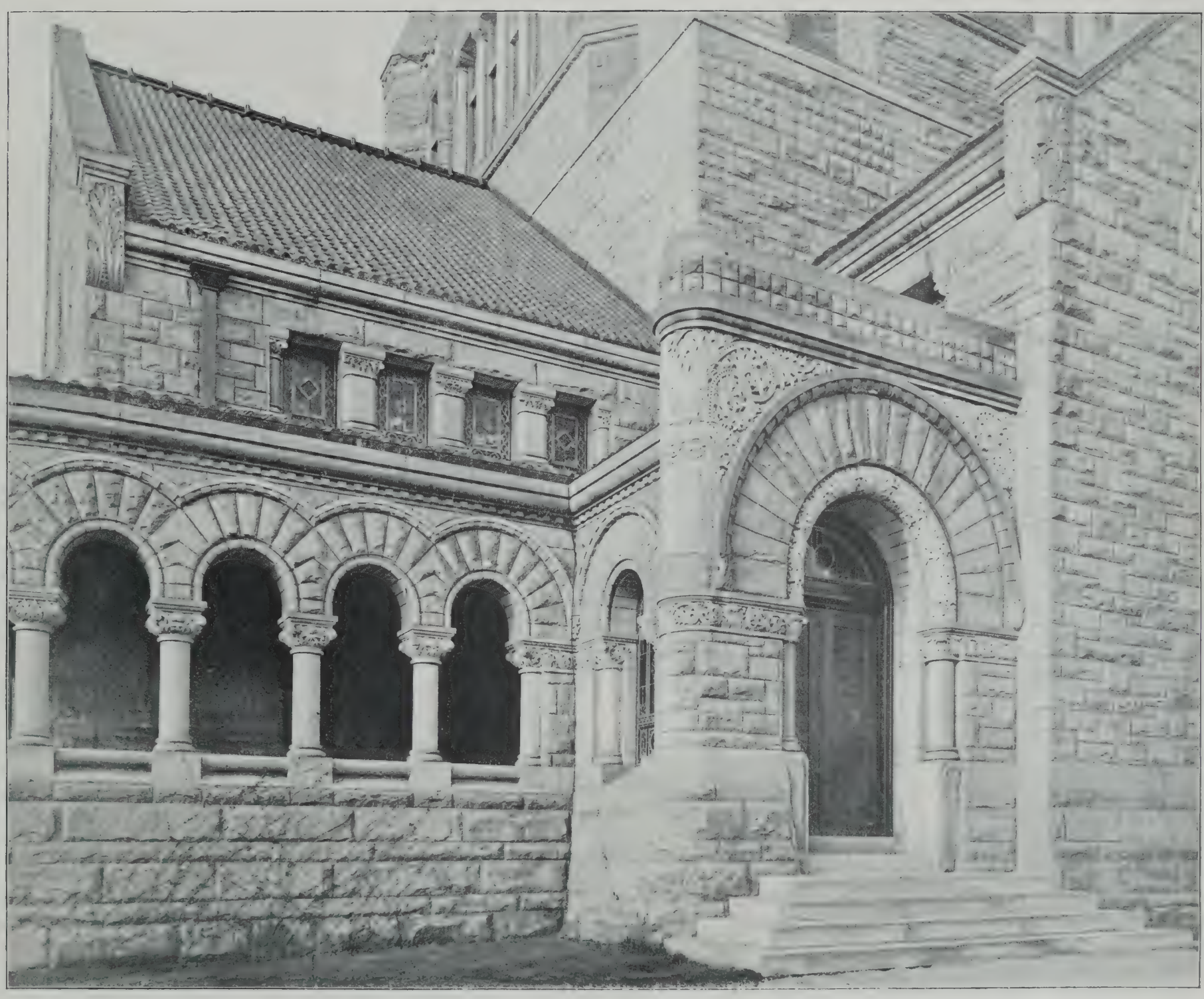

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CHRIST'S M. E. CHURCH, PITTSBURG, PA.—See page 96.

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ESTABLISHED 1845.

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No. 361 BROADWAY, NEW YORK.

NEW YORK, JUNE, 1896.

THE

Scientific American,

BUILDING EDITION.

ESTABLISHED 1885.

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EVILS OF UNRESTRICTED HEIGHT IN CITY BUILDINGS.

Although the lofty office building is essentially a modern product, it has been long enough in our midst for a decided change of sentiment to take place regarding its public utility.

When the pioneer "sky-scraper" raised its lofty front far above the average sky-line of our streets, it was regarded with curiosity, and some degree of admiration, as showing the constructive skill and daring of the architect and engineer. As long as the number of such buildings was limited, no one questioned the right of their owners to run them up as high as they pleased. In the last few years, however, their rapid multiplication has developed certain public risks and inconveniences which call for restrictive legislation.

The principle of the greatest good of the greatest number is getting to be recognized as the safest guide in adjusting rival interests in all makers of municipal government. From the standpoint of the individual owner, the tall office building is a profitable investment; from the standpoint of the general public, its excessive height is an eyesore, and more or less of a public inconvenience. Any restrictive legislation which may be enacted will be founded entirely upon considerations of public health and convenience; and the only hardship such legislation can work will be to reduce the profits on such buildings, and incidentally to prevent them from monopolizing the city's supply of light and air. The question of the greatest allowable height is a question of public expediency, pure and simple; for there are no essential difficulties of construction to prevent them from being carried up as high as the depth of the owner's purse will allow. The strength of the materials used may be ascertained by actual test; and any qualified architect or engineer is capable of designing a skeleton building, so many hundred feet in height, that will be proof against anything short of a violent earthquake.

Moreover, it is safe to say that, if the very best type of fireproofing be used, the building may be made tolerably secure. It is true the destruction of the Manhattan Bank Building, New York, gave a rude shock to public confidence in the efficacy of fireproofing; but it must be remembered that this building did not represent the best modern methods, and the work was very incompletely done.

It is the security afforded by the fireproof system of construction, and the relatively large profits realized by the lofty building, that have caused it to spring up so rapidly in our midst Judged relatively to the value of the ground it covers, the profits of such a building will be proportionate to its height. Of course, in saying this, it is admitted that the massive construction, and the increased rates of insurance, of a 300-foot building will render its first cost and some of its current expenses greater per foot (if it may be so expressed) than those of a building one-third of the height—and to this extent the net profits will be reduced. In a comparison of three 100-foot buildings with one of 300 feet, each of the four covering an equal area of ground, there will be but one ground-rent, one power and light plant, and one staff of employés for the single building, as against three of these for the separate buildings. Judged on the ground of mere business expediency, the modern "sky-scraper" is the proper building to put up.

But, fortunately for the future appearance and well-being of our cities, it is now well understood that the unlimited height of these structures involves other and more serious issues than the mere profit of the individual owner. In the first place, they shut out the light and air from the adjacent streets, and render them gloomy and more or less damp and unwholesome. It is not sufficient to claim that such inconvenience can be covered by damages; for the payment of damages would only reach one side of the trouble. It might satisfy the proprietor; but it would not compensate the employés in the darkened building for the loss of sunlight, and the injurious effects of continuous labor by artificial light.

There is another serious objection to unlimited height in the fact that it produces a great congestion of traffic. For it is evident that the volume of traffic within a given area will be largely determined by the number of people that reside and do business within it. If, for example, the whole of lower Broadway, New York, and the streets which lead into it were lined with twenty-five story buildings, there are certain hours of the day when it would be well-nigh impassable. Admitting that formerly a saving of time and certain other conveniences were secured by gathering the chief business interests of a city within the smallest possible compass, the telephone and improved transit facilities have rendered such concentration unnecessary to-day.

Finally, there is the objection to unlimited height on æsthetic grounds—an objection which already counts for much, and ought to count for more than it does. The exaggerated height of a twenty-five story block is condemned by the simplest principles of architectural design; and its effect upon the appearance of the surrounding buildings and the street in which it stands is disastrous. There must be a proper proportion of the width of a street to the buildings which flank it, if it is not to look mean and inadequate.

A thoroughfare which is imposing, if lined with blocks 100 feet high, will take on a narrow and alley-like appearance when dominated by buildings 300 feet high. The mind has an innate respect for great size and mass as such, and the placing of one of these giants alongside a building of moderate height, no matter how great may be the beauty of the latter, will exercise a dwarfing or belittling effect upon it.

The durable nature of the materials in our modern buildings is such that their life will be reckoned by centuries. In permanence, they will rival the works of the ancients. Let us see to it that in design they do not fail utterly by comparison.

A SCRANTON (PA.) RESIDENCE.

Our view and floor plans on page 89 illustrate the residence of H. W. Kingsbury, Esq., at Scranton, Pa. The view shows an exterior in the Flemish style, in which brick and shingles have been combined to gain the desired effect. Dimensions: Front, 63 ft.; side, 43 ft., including all projections. Heights: Cellar, 8 ft.; first story, 10 ft.; second, 9 ft.; attic, 8 ft. Underpinning and structure above mostly of cream-colored bricks, with white stone trimmings; roof, as well as portion of side, shingled. The plans show a convenient arrangement of rooms. There is a broad, well-shaded veranda, with a wide entrance door, with side lights opening directly on reception hall, which runs full depth of house, and is finished in whitewood, painted white, and enameled; has staircase at farthest end, with mahogany hand-rail. All principal rooms connect by sliding doors. The reception room, with its circular bay effect and fireplace, is finished same as hall; parlor, with nook, having fireplace and seats, is finished in whitewood natural. The kitchen, with usual fixtures, connects by means of butler's pantry, provided with dresser, etc., with dining-room, having wide mullioned window and fireplace; particular attention has been paid to the finish of this room; the wainscoting, 5 ft. in height, is treated in a manner entirely out of the ordinary, having merely a very neat, moulded base and cap, there being between these extremes only a smooth, highly polished, unbroken surface (nothing whatever to catch the dust or dirt), depending entirely upon the grain of the wood used, figured red birch, for effect, which is most beautiful, presenting, as it does, the appearance of a very large, handsomely polished board; the ceiling beams are exposed, and cased in with the same wood. Second floor, as well as attic, is finished in whitewood, stained variously for the different rooms. There are four chambers, three of which contain fireplaces, as does the den, stained green; bathroom in white enamel, has the usual fixtures of best make, plumbing being exposed; the principal chamber has window opening on projecting iron balcony, supported on brackets of neat design; attic has three rooms finished off. Cellar, all cemented, contains laundry, servant's bathroom, coal storage and vegetable apartments; polished plate glass has been used throughout. Cost of house, complete, was less than $12,000. E. G. W. Dietrich, Esq., architect, 18 Broadway, New York City.

Our engravings were made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.

AN ENGLISH HOUSE.

We show on page 88 of this issue a stone and cement house recently erected for Professor Woodrow Wilson, of Princeton University, at Princeton, N. J. This house is in the early English or Elizabethan style, and the beamwork has been carried out according to the Medieval customs, when the beams were really supports and parts of the frames. This is essentially different from the English designing which was carried out from the Restoration down, where embroidered designs and curves and circles were mixed in with the artistic beamwork. The house as shown on the floor plan contains a large central hall and library; side entrance from the piazza. There is a parlor, study, dining-room, butler's pantry, laundry, and kitchen on the first floor. The second floor is divided into five main bedrooms and two servants' bedrooms. This house was built from the plans and under the superintendence of Child & deGoll, architects, 62 New Street, New York City.

Our engravings were made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.

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A RESIDENCE AT OVERBROOK, PA.

The engravings shown on page 84 and below present one of the most unique and picturesque residences, recently erected for William L. Price, Esq., at Overbrook, Pa. The design is a pure example of its style in English architecture, not only in its design and lines, but throughout in all its details. The architect has struck a medium in designing this building, by which the detail and ornamentation are of a high order, and at the same time presenting a solid and substantial appearance, which is often left unstudied in the majority of new creations. The underpinning, balustrade at piazza, and first story are built of rock-faced Chestnut Hill granite. The second and third stories are beamed, forming panels, which are filled in with plaster work, the trimmings being painted bottle green. The roof is slated. Dimensions: Front, 54 ft.; side, 44 ft., not including piazza. Height of ceilings: Cellar, 7 ft.: first story, 9 ft. 6 in.; second, 9 ft.; third, 10 ft. Vestibule is paneled in oak, and it has massive oak doors. The main hall is trimmed with oak, darkened and finished in old English oak. It has a paneled wainscoting, ceiling beams, and an ornamental staircase with carved newel posts and balusters. A bay window is thrown out at first landing, glazed with leaded stained glass, and shedding a soft light over upper and lower halls. The fireplace in hall is built of brick, with hearth and facings of same, and a massive carved mantel. Toilet room is conveniently located, and is fitted up complete. The drawing-room, of good dimensions, is treated in the Empire style. It has a paneled wainscoting to a height of two feet, and the wall space above is lined in panels, the tone of coloring being white and green. The library and den are trimmed same as hall, and the former contains a paneled divan and combination of bookshelves and cupboards, as shown in the interior view. The fireplace is furnished with tiles and mantel. The dining-room is treated in a dainty manner, with ivory white trim and white and blue walls. There is a corner china cabinet and an opening out upon porch. Butler's pantry, rear hall, and kitchen are trimmed and wainscoted with yellow pine and finished natural. These apartments are fitted up in the best possible manner. The second floor is treated in an artistic manner. It contains five bedrooms, ten closets, and bathroom. Two of the bedrooms have projections thrown out, with latticed windows and paneled seats. The bathroom is wainscoted and furnished with the best modern fixtures, with exposed and sanitary plumbing. The special feature on third floor is the large music-room, with groined arches. This floor also contains two bedrooms. Cemented cellar contains laundry, furnace, storage, and other apartments. Mr. William L. Price, architect, 731 Walnut Street, Philadelphia, Pa.

Our engravings were made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.

VIEW OF W. L. PRICE'S RESIDENCE AT OVERBROOK, PA.

COTTAGE AT "OAK PARK," ENGLEWOOD, N. J.

This dwelling, illustrated on page 93, contains four bedrooms and a bathroom on second floor, and parlor, dining-room and kitchen on the ground floor. The special features of this design are compactness in arrangement, ample closet room, and the combined cellar-way and rear entrance. The building is white plastered, and has bright staircase and painted trim, hot air furnace in cellar, and open plumbing throughout. The workmanship and materials are the best, and, as a result of careful planning and execution, the house cost, complete, $2,730, and was built from the plans by Demarest & Sons, builders, of Englewood, N. J.

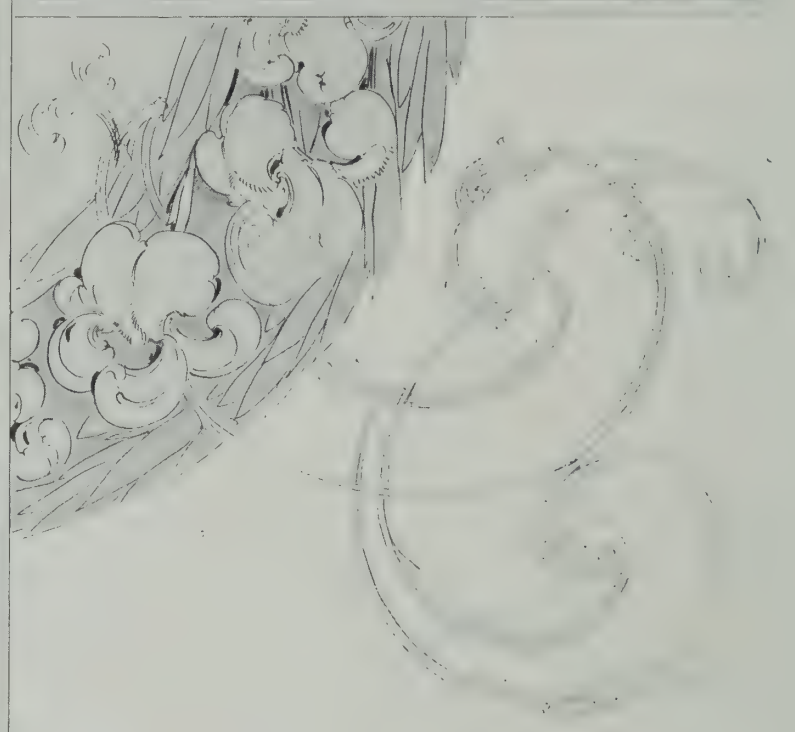
Our engraving was made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.

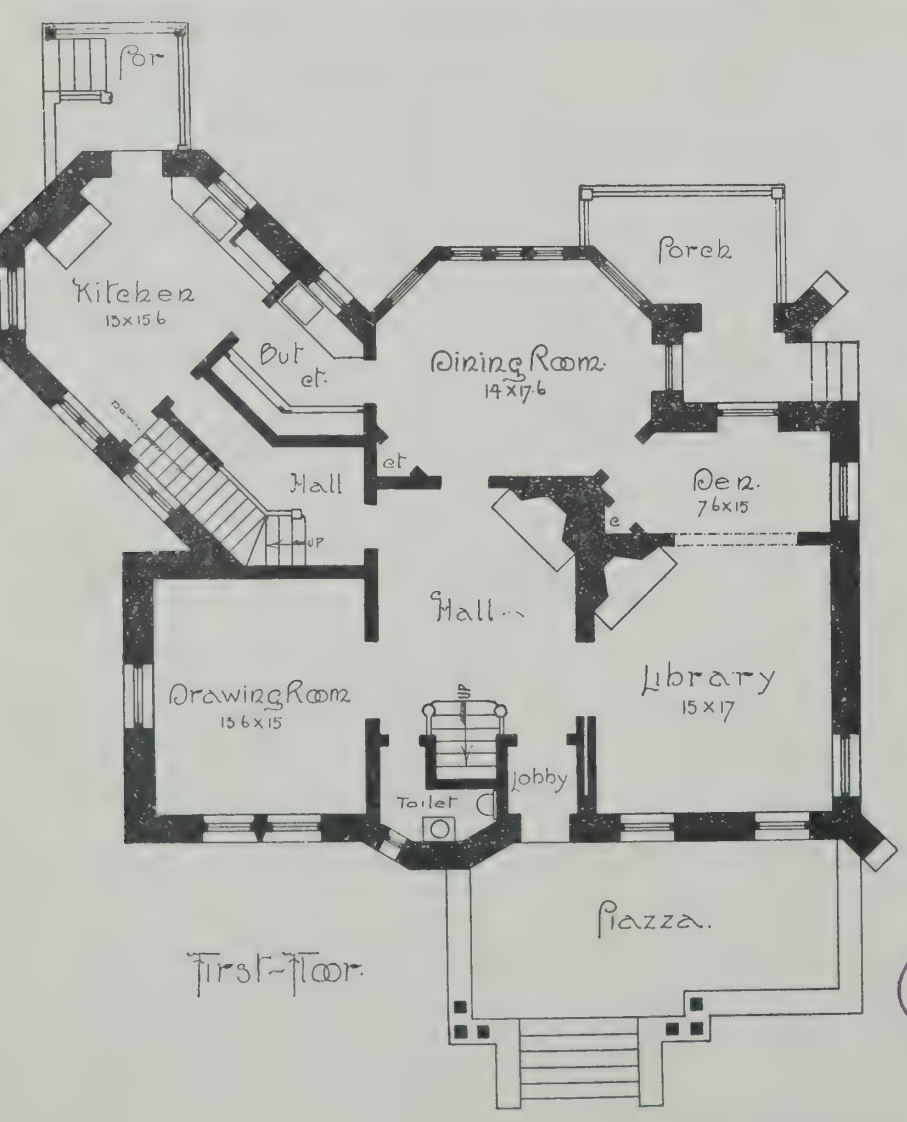
A MODERN RESIDENCE AT JAMAICA, N. Y.

We publish on page 92 a modern residence, which has been recently erected for Henry A. Monfort, Esq., at Jamaica, N. Y. The whole scheme of treatment is not of a decided style, but is what can safely be called American architecture. There are some excellent features and good lines, including the spacious piazza, bay-windows with rounded corners, tower with outlook, and loggia. The whole is crowned by a roof with a graceful slope to its lines, and which add much beauty to the elevations. The plans are well arranged, and each apartment is located conveniently with each other. The underpinning is built of rock-faced stone laid up at random. The exterior above is clapboarded and shingled. The clapboards are painted a reddish brown color, while the shingles are stained sienna; the trimmings are painted bottle green. The roof is shingled, and stained moss green. Dimensions: Front, 34 ft. 6 in.; side, 58 ft. 6 in., not including piazza. Height of ceilings: Cellar, 7 ft.; first story, 10 ft.; second, 9 ft. 6 in.; side, 8 ft. 6 in. The entrance is provided with a broad door, with stained glass windows on either side of same. The hall is trimmed with oak. It contains a nook with open fireplace, built of brick, with hearth, facings, and shelf of same, and an ornamental staircase, with carved newel posts, balusters, and rail. This staircase is well lighted by glass windows of delicate tints, and the hall has a parquet floor. The parlor and sitting room are trimmed with sycamore, and are connected by sliding doors; the latter is provided with an open fireplace, furnished with facings and hearth of white enameled tiles, and a mantel of excellent design. The library and dining-room are trimmed with oak, and each has fireplaces handsomely trimmed, and furnished complete, and also side entrances from porches. Kitchen and pantries are wainscoted and trimmed with yellow pine, and fitted up with the best modern fixtures. Second floor is trimmed with whitewood and finished natural; it contains five bedrooms, closets, dressing-room with stationary bowl, and bathroom. Bathroom is wainscoted with oak, and is provided with porcelain fixtures and exposed plumbing, and is fitted up in a most exquisite manner. Third floor contains three bedrooms and ample storage. Cemented cellar contains furnace, laundry, and other necessary apartments. Mr. Henry E. Hargaard, architect, Richmond Hill, Long Island.

Our engravings were made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.

CORNELL UNIVERSITY is to have a separate college for the study of architecture. It will follow the same lines as the celebrated École des Beaux Arts, at Paris, and every effort is to be made to bring it up to the standard of the famous French school. The entrance examinations will be more severe than under the previous organization, and will include some of the sciences which were formerly part of the subsequent architectural course.





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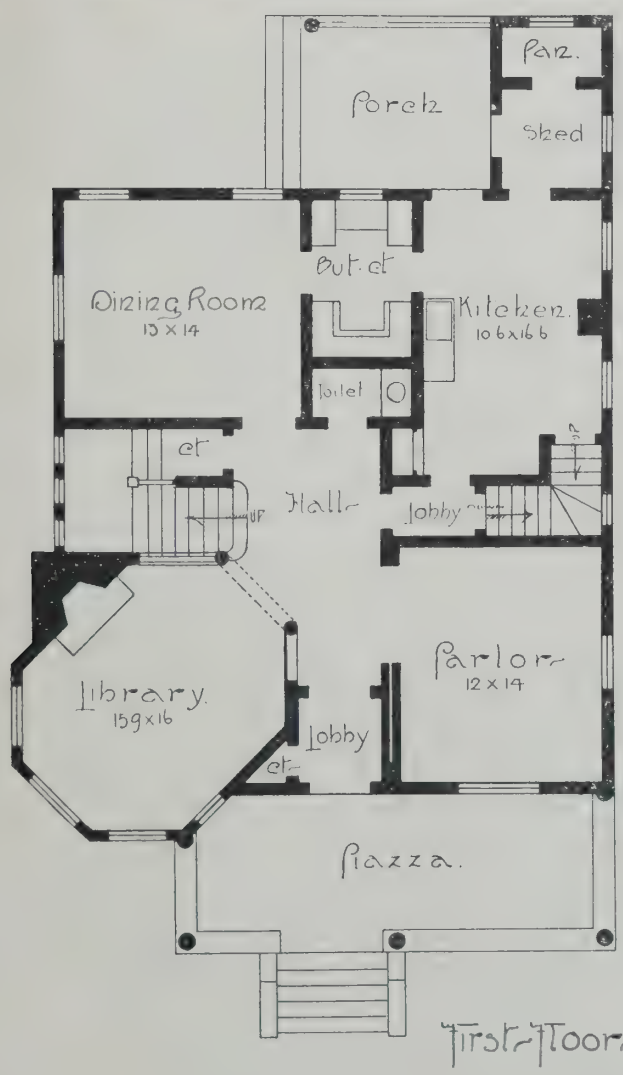
A RESIDENCE AT OVERBROOK, PA.—See page 83.



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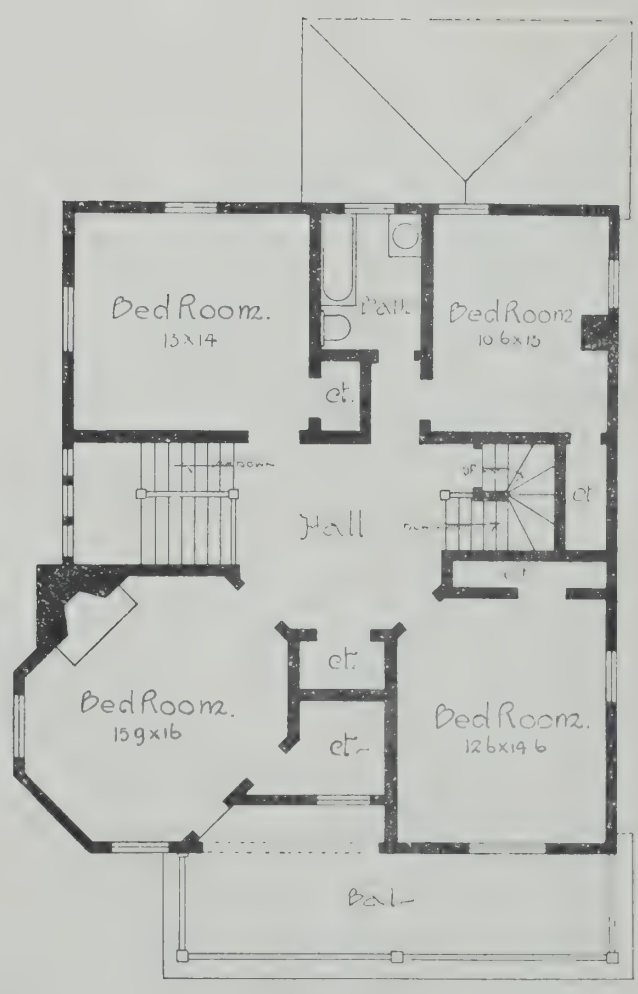

Second Floor.

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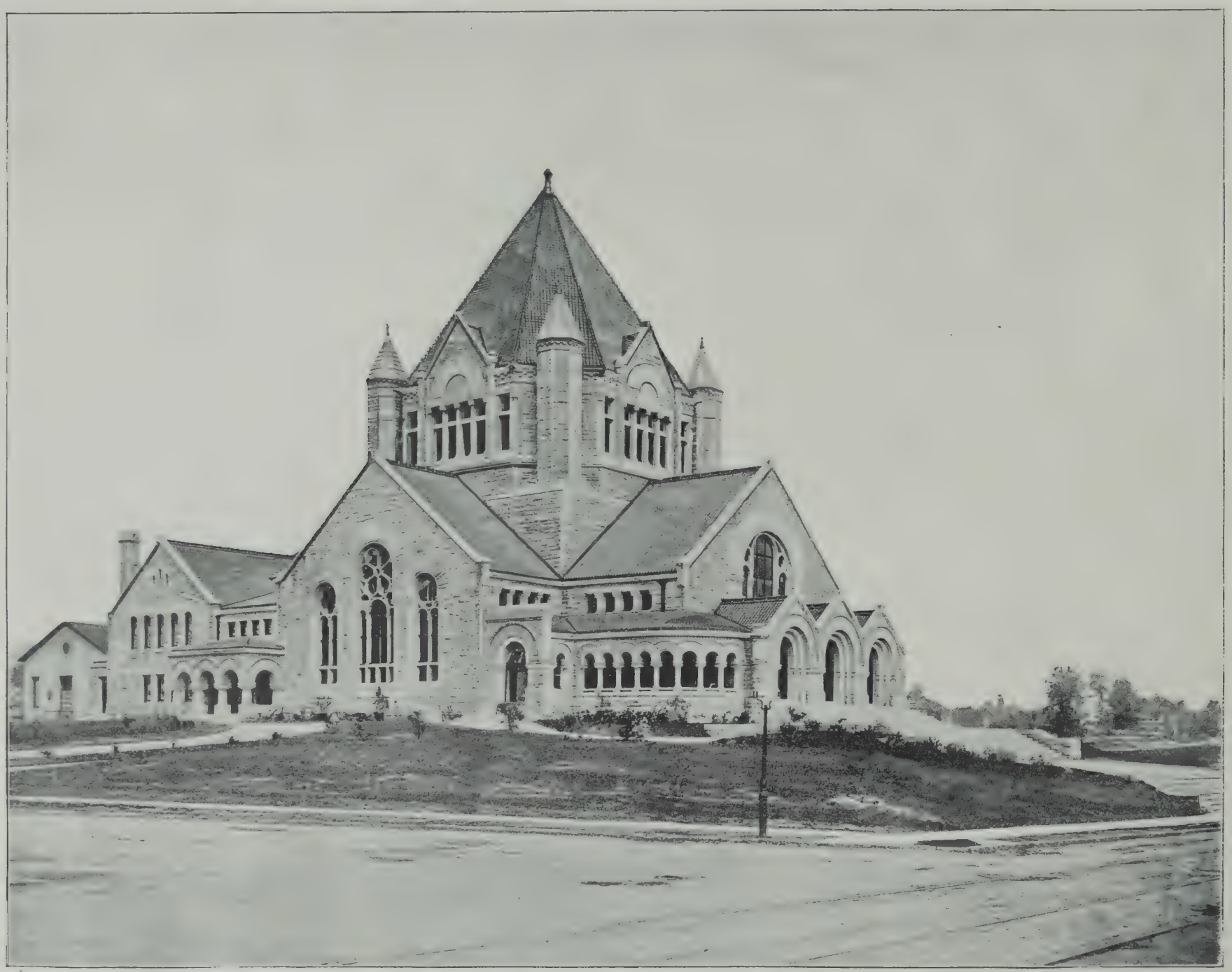
A MODERN DWELLING HOUSE.—See page 96.



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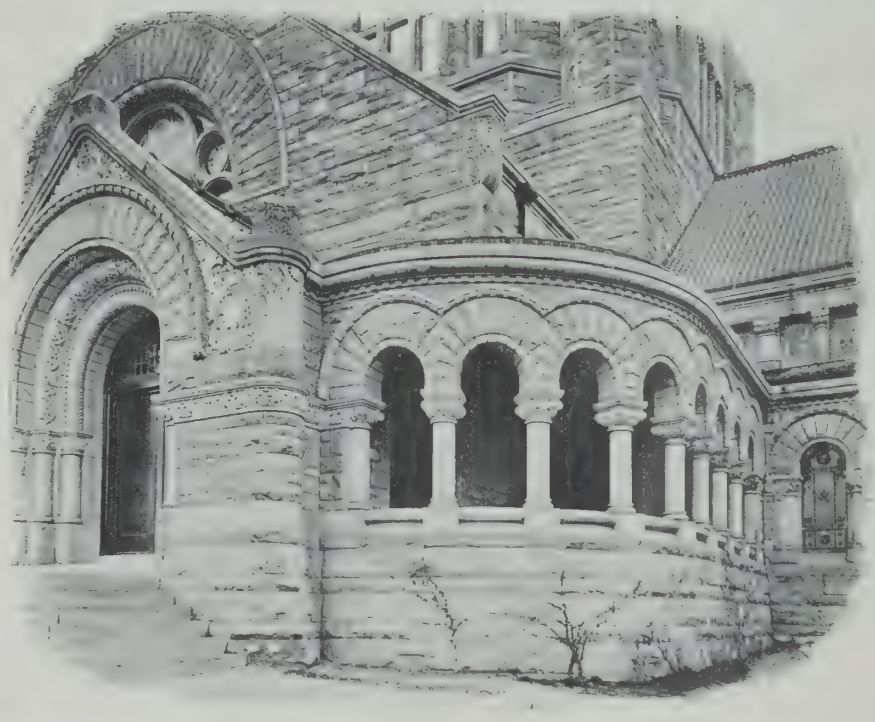

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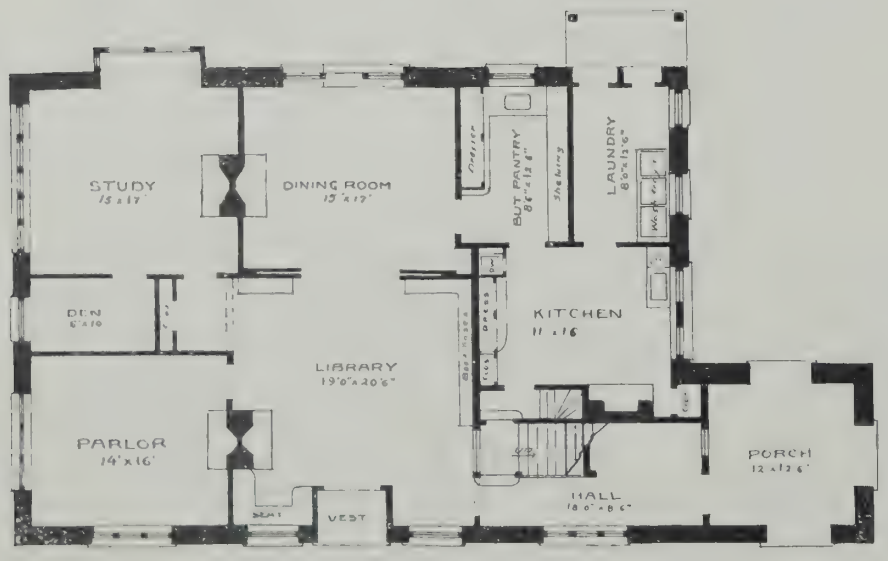

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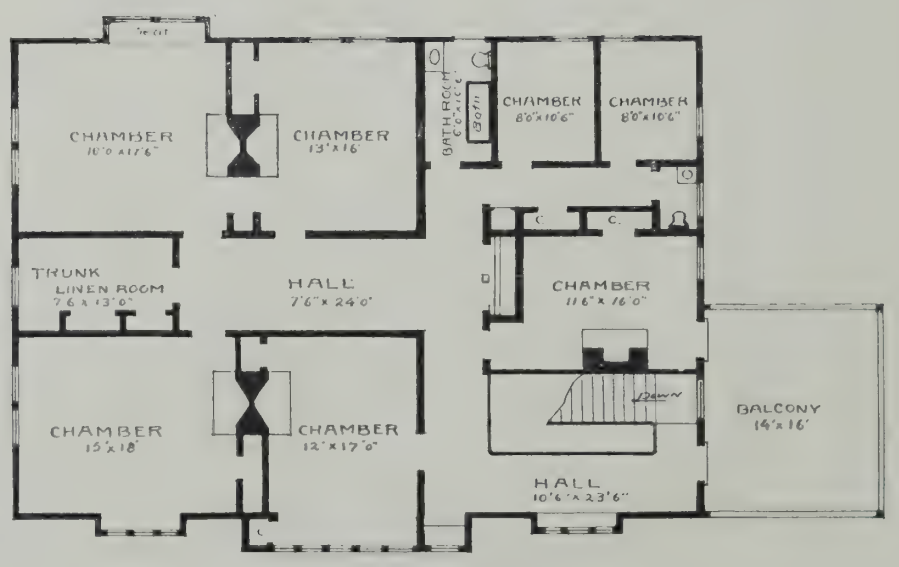

PLAN OF SECOND FLOOR.

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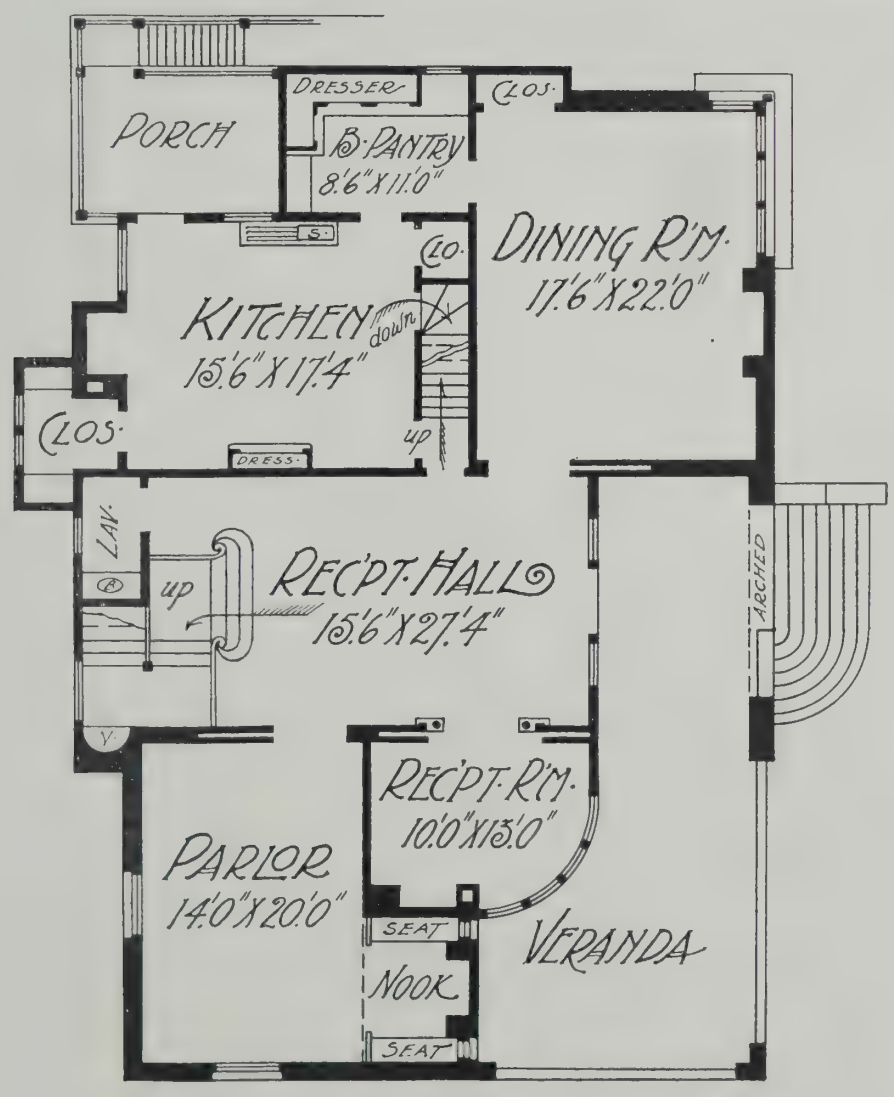
AN ENGLISH HOUSE.—See page 82.



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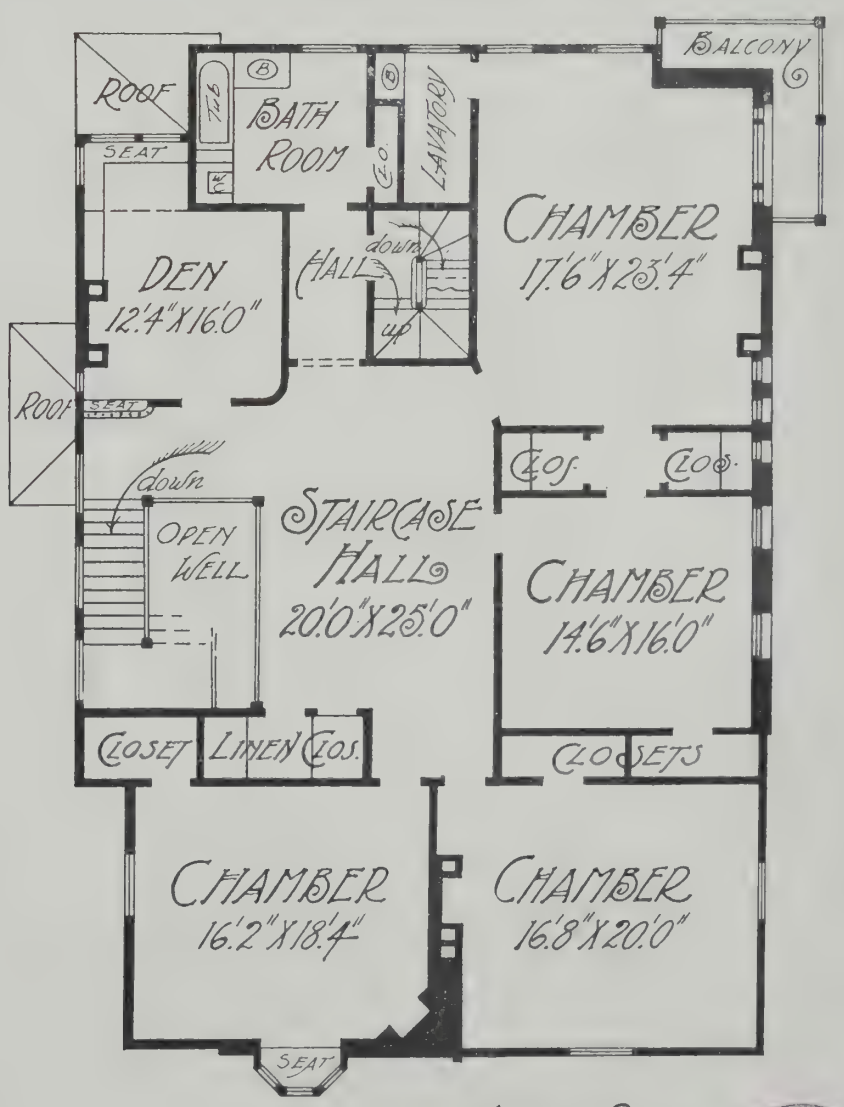

SECOND FLOOR PLAN.

A SCRANTON, PA., RESIDENCE.—See page 82.

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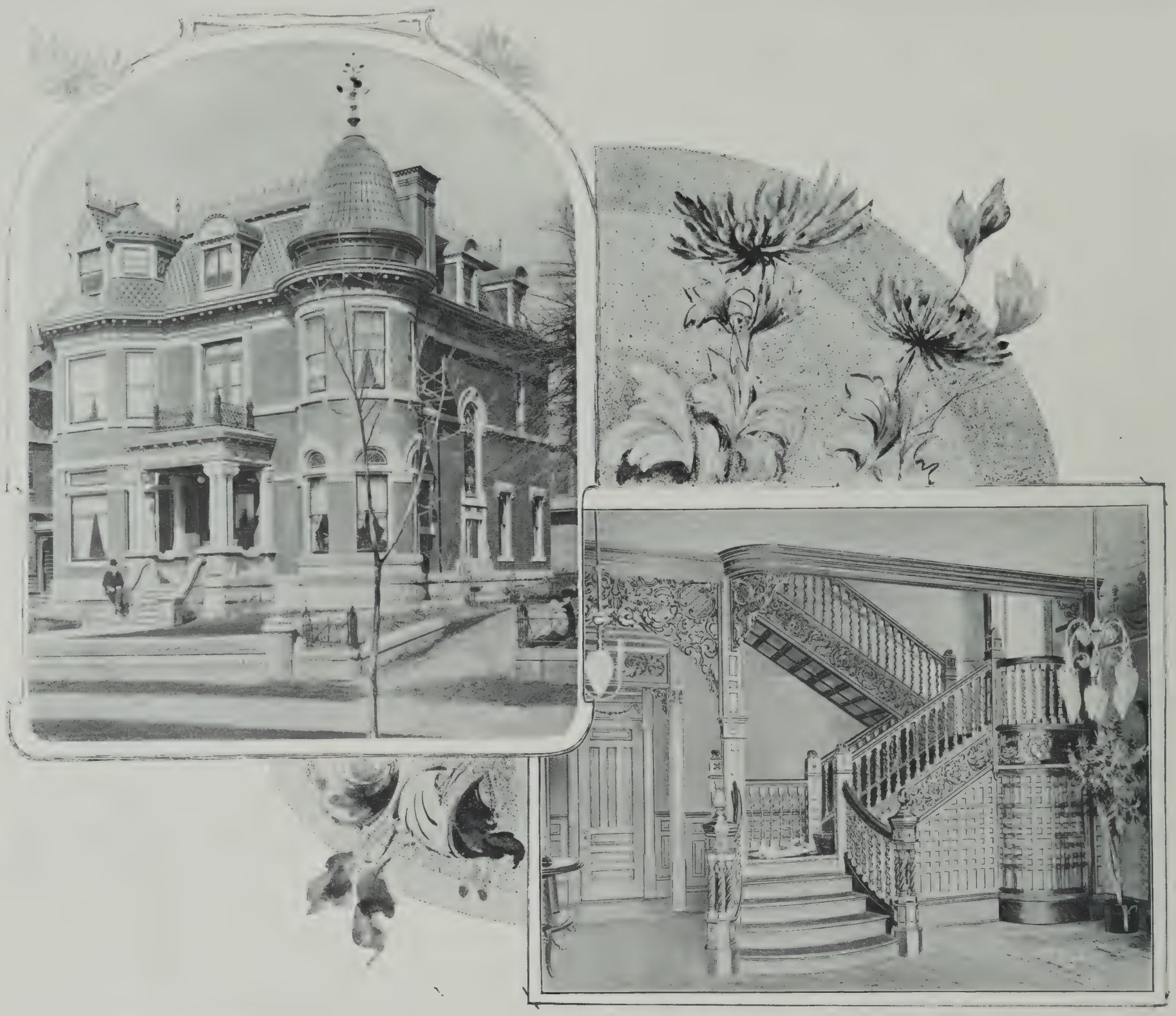

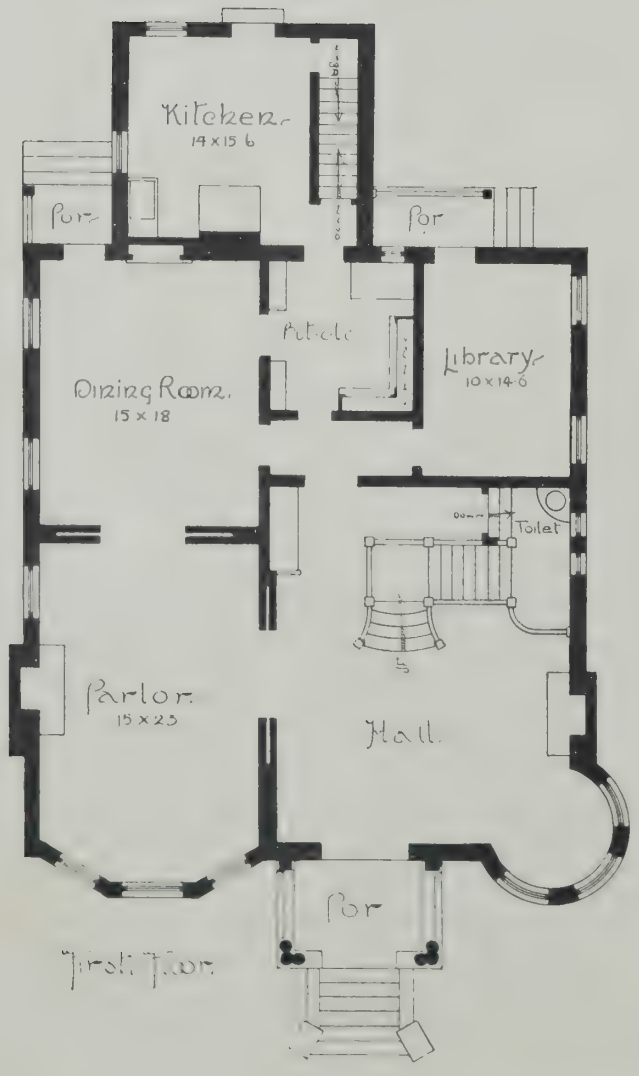

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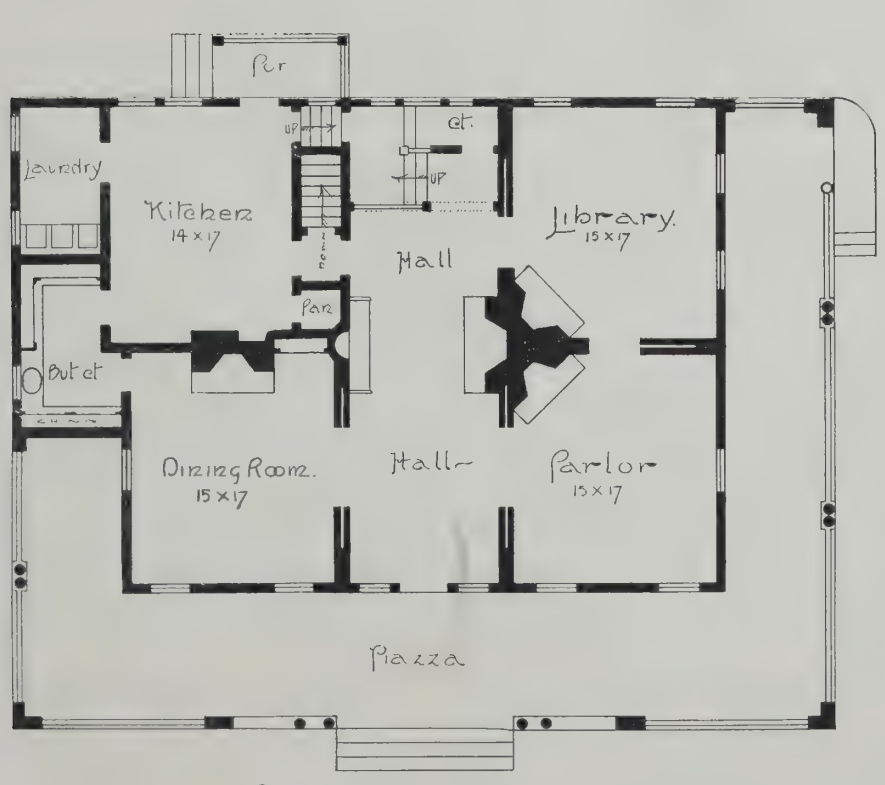
A RESIDENCE AT SALT LAKE CITY, UTAH.—See page 95.



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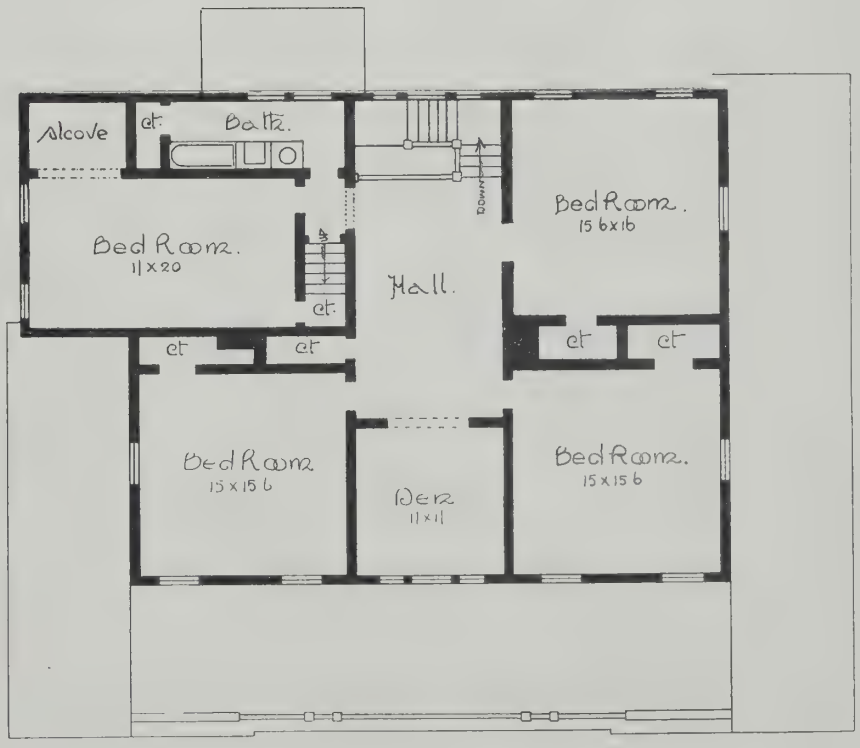

Second Floor

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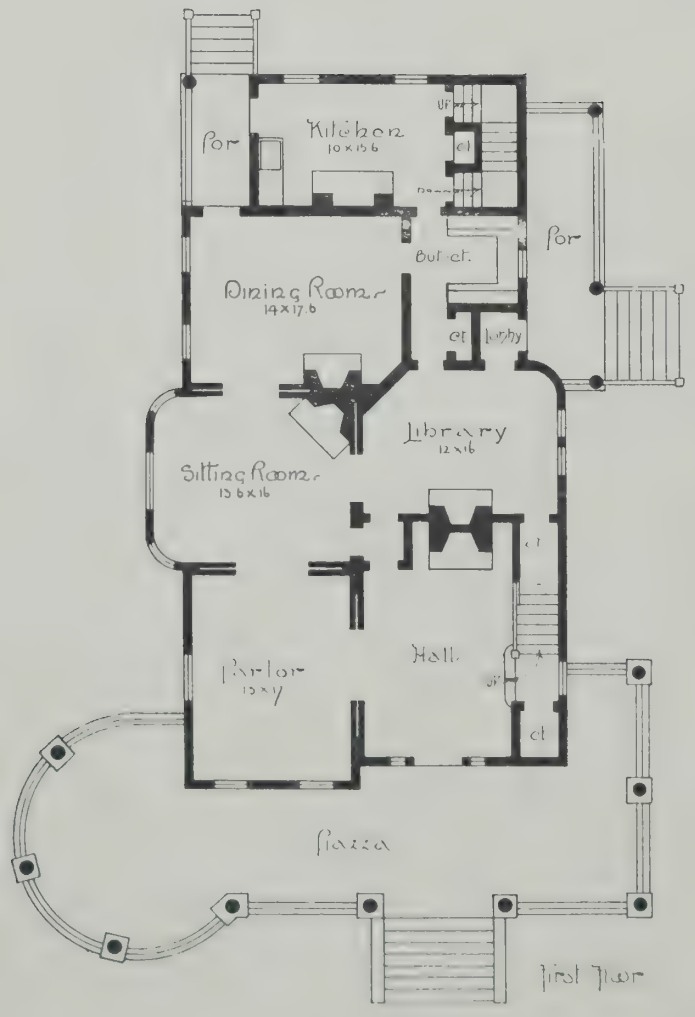
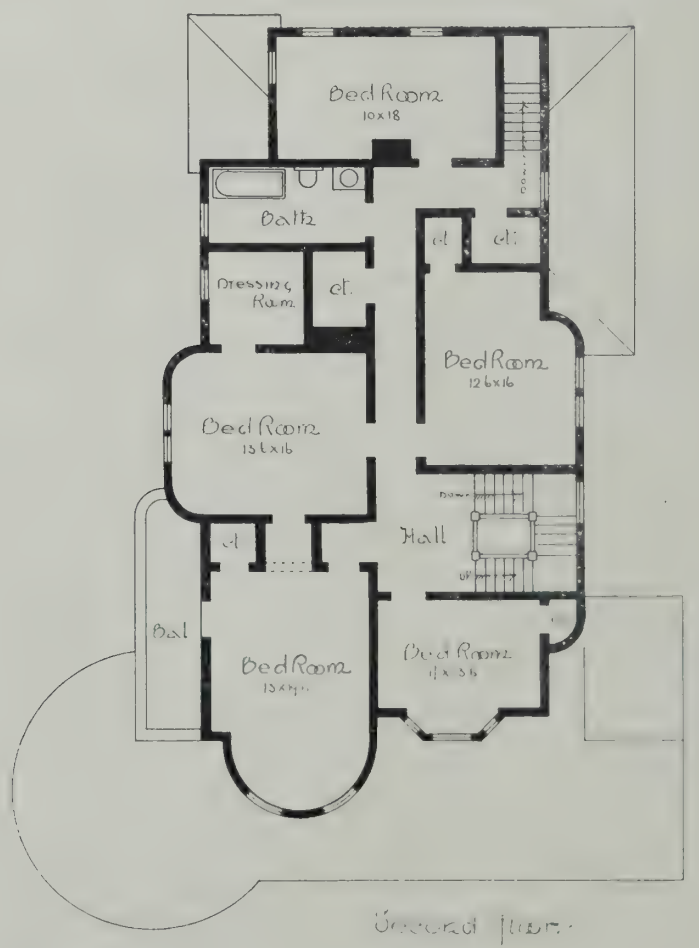
A COUNTRY HOUSE AT POMPTON, N. J.—See page 95.





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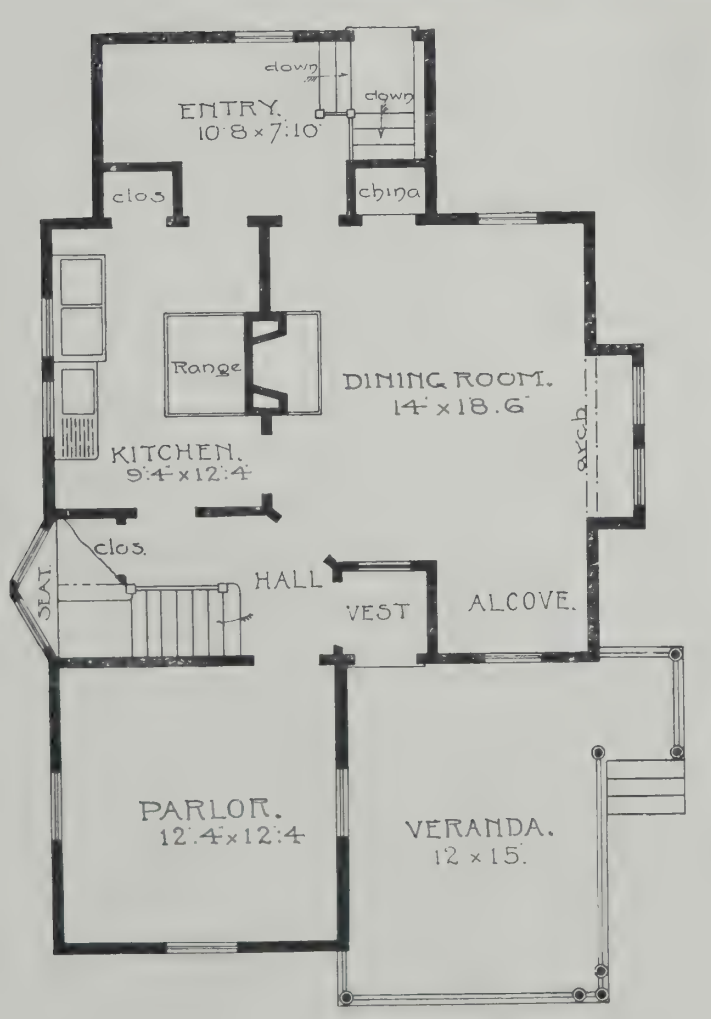
A MODERN RESIDENCE AT JAMAICA, N. Y.—See page 83.



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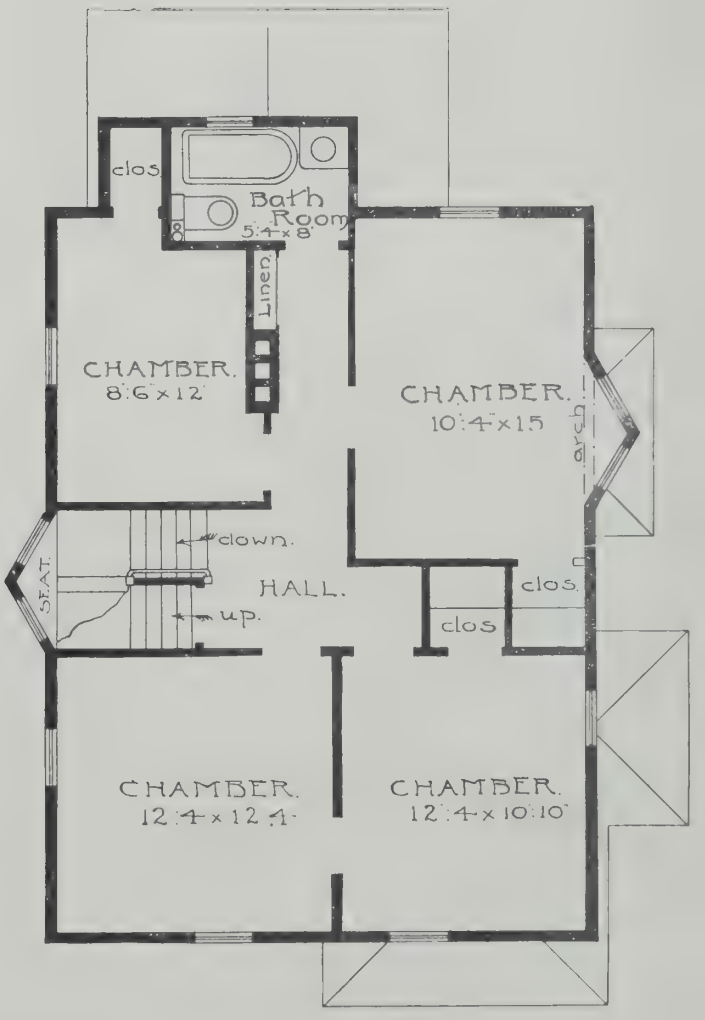

SECOND FLOOR.

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COTTAGE AT "OAK PARK," ENGLEWOOD, N. J.—See page 83.

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2.

3.

4.

5.

6.

THE STRATFORD LIBRARY.—See page 95.

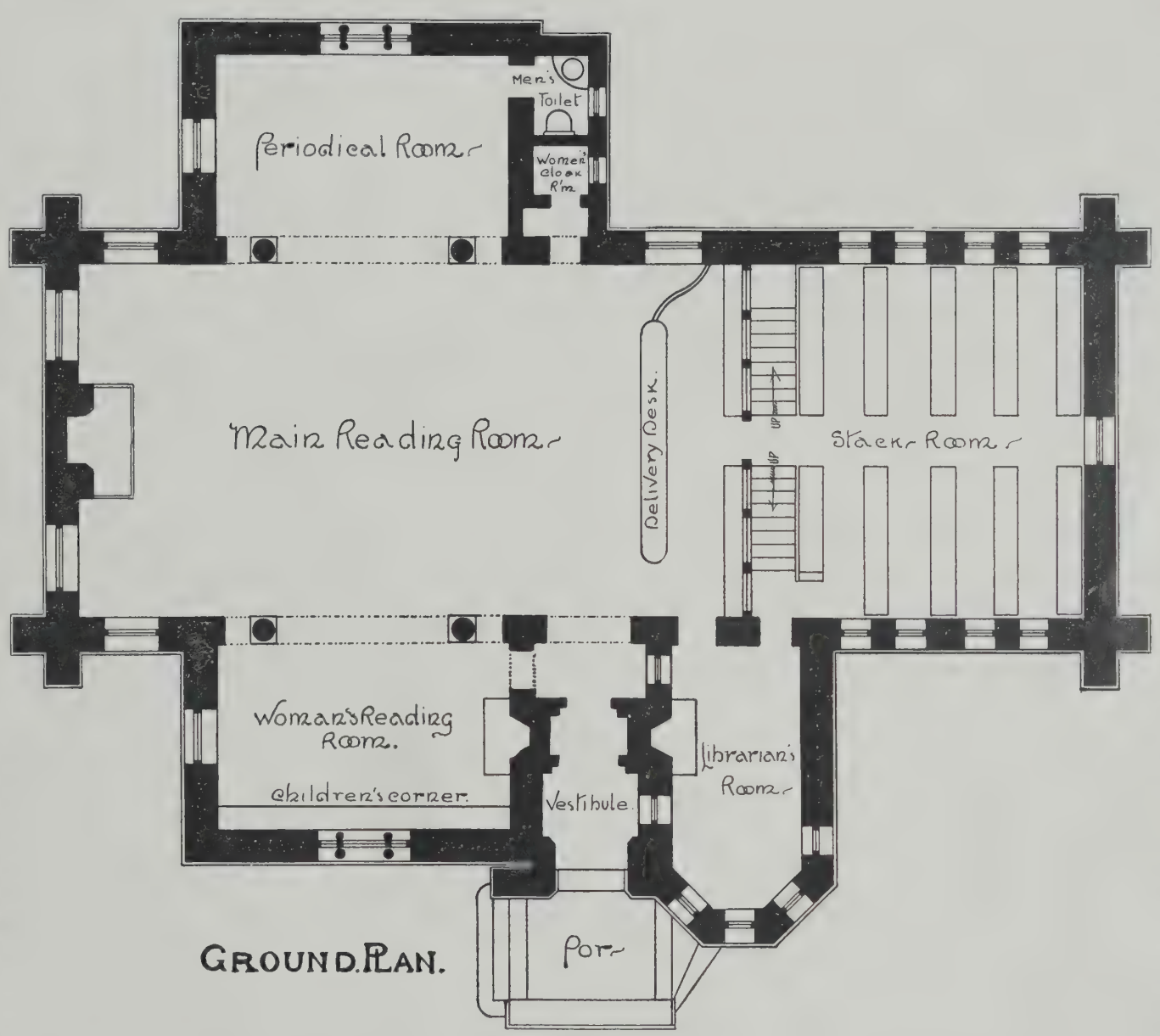
1. Interior of Reading Room, looking from Entrance toward Front. 2. Bronze Tablet. 3. The Stratford Library Building. 4. Memorial Fireplace.
5. Interior of Reading Room and Northern Alcove. 6. Entrance.

BOSTON PUBLIC LIBRARY

THE STRATFORD LIBRARY.

We illustrate on page 94 the Stratford Library building, at Stratford, Connecticut. This institution was founded, some eleven years ago, as a private library, and was supported largely by subscriptions and the proceeds of entertainments given from time to time, until the year 1893, when substantial legacies, together with the munificent gift of a former resident of Stratford, Mr. Birdseye Blakeman, allowed the materializing of one of the most unique, attractive and picturesque library buildings in the State. The building (Figure 3) was erected in memory of Mr. Blakeman's ancestors, who were among the first settlers, and had lived in the old town of Stratford for two and one-half centuries. Mr. Blakeman purchased a very desirable site on Main Street, and in 1894 constructed thereon the building which we illustrate, at an estimated cost of $25,000, presenting it to his native town to be used as a public library, and also donated the sum of $5,000 for the purchase of additional books. Unfortunately, Mr. Blakeman did not live to see the building fully completed, but passed away at his country residence, at Stockbridge, Mass., September 30, 1894. His will provided for the completion of the building, and although it was practically finished before January, 1895, it was not dedicated or opened until January 16, 1896, owing to the delay incident to the settlement of his estate. The dedication exercises may be noted as one of Stratford's rare historical events, and was regarded as a step in its educational progress. Among the distinguished persons attending was Dr. Timothy Dwight, President of Yale University. The affairs of the library are managed by a board of directors, under a special act of incorporation by the State of Connecticut. The Rev. Joel S. Ives is President; George W. Fairchild, Vice-President; Edwin F. Hall, Treasurer, and Henry C. Evans, Secretary. Mr. Frederick C. Beach, of the SCIENTIFIC AMERICAN, is one of its directors, and it is to him we are indebted for the illustrations presented. The building is treated in a pleasing style of architecture, with Romanesque feeling, and some of the principal features is the chimney at front, the flues of which are carried around either side of the circular window, terminating in the usual manner: the vaulted entrance way, with its carved pinnacle, and the combination chimney and tower, the latter being provided with a carved frieze of graceful design. It is constructed of marble, furnished by the St. Lawrence Marble Company, and a novel feature of its construction is that the building was laid out at the quarry, and each block was sawed out, numbered, shipped to Stratford, and placed in their respective positions. The main walls are rock-faced ashlar, while the trimmings are dressed. The roof is covered with a reddish brown glazed tile. The entrance (Figure 6) is through a vaulted vestibule, with massive oak doors and wrought iron trimmings. Upon entering the main reading-room (Figures 1 and 5), a vista is obtained of the whole interior, including the alcoves, of which we present additional views. The interior throughout is trimmed with oak, very handsomely finished and polished, and the walls have a rib-paneled wainscoting, and a massive cornice of similar wood. The floors are laid with oak in narrow widths, and polished. One of the most striking features of the interior is the colonnade effect between reading-room and alcoves, which is formed by columns running from floor to ceiling, of the same materials as the outside walls, but highly polished, and finished with elegantly carved caps. Another detail worthy of note is the bronze tablet (Figure 2), in memory of Mr. Blakeman's ancestors, which is cast out of solid bronze, and is surrounded by a frame of marble and similar bronze. The medallion portrait of Mr. Blakeman is the work of Olin L. Warner, of New York. The memorial fireplace (Figure 4), at the street end of the building, is furnished in a handsome manner. It is built of brick, with hearth of tiled brick and facings of tiles, with panels representing Fame and Fortune, surrounded by a marble frame, and is provided with massive dog-irons, of wrought iron, and a carved mantel, and the whole surmounted by a very excellent oil painting of the donor of the building, Mr. Blakeman. This painting was painted by J. Collins Forbes, of Ithaca, New York, an artist of national repute. The alcoves (Figures 1 and 5) have cluster windows, separated by columns, with carved capitals; the northern alcove is provided with an open fireplace, fitted up with tiled hearth and facings, and mantel. The whole color scheme is most happily rendered, and is in harmony with the woodwork and other furnishings. The main walls are treated with a soft, brownish yellow color, while the dome-shaped ceiling has a lighter shade. The windows are glazed with plate glass, and each window has a transom of delicate tinted glass, shedding a soft and pleasant light over the various apartments. In the centre of each transom appears the name of some distinguished author. This work was done by J. & R. Lamb, New York.

The librarian's room is conveniently located at the right of the entrance, and is provided with bookcases built in, and an open fireplace. The stack room (shown in Figure 5), in the rear of the building, separated from the reading-room by a glass partition, is equipped with Stikeman patent adjustable book racks, is three stories in height, running from basement to peak, and will accommodate 40,000 volumes, the framework being of iron and the walls of stone; the room is practically fireproof. The same is also true of the entire building, as the floor is supported upon iron girders, filled in with hollow brick and cement. An attractive feature of the furnishings is the lamps, which are vases of Spanish pottery of a greenish hue, with bronze bases, made from special designs. The toilet rooms are fitted up in a substantial manner with the best sanitary improvements and exposed plumbing. The cemented cellar contains furnace and ample storage room. The tower contains a room on second floor. Mr. W. H. Miller, architect, Ithaca, New York.



GROUND PLAN.

A RESIDENCE AT SALT LAKE CITY, UTAH.

We present herewith, on page 90, a residence recently erected for F. D. Clift, Esq., at Salt Lake City, Utah. The design shows an excellent example of the many modern houses being erected throughout the State. The building is constructed in a very substantial manner, and of the best materials and workmanship. It is built of red pressed shale brick, laid up in red mortar, and trimmed with gray Keyune stone, dressed smooth and rock-faced alternately. The curbing, posts, steps, balustrade and porch are of similar stone and neatly carved, making the entrance bold and massive, and adding much to the appearance of the building. The roof is covered with 18 oz. copper, Newport, shell tile shingles, the first and only roof laid with copper in the State. All the water is carried to the rear of the building by means of a copper gutter. Dimensions: Front, 42 ft.; side, 59 ft., not including porch. Height of ceilings: Cellar, 8 ft.; first story, 12 ft.; second, 10 ft. 6 in.; third, 9 ft. The cemented cellar contains laundry, coal, vegetable, furnace and wine rooms. The main hall is a spacious apartment, and is very handsomely fitted up. It has a paneled divan, paneled wainscoting, an open fireplace, trimmed with tiled hearth and facings, and mantel, and an open staircase, with carved newel posts and spiral balusters. This staircase is treated with other bits of carving, transoms and a stained glass window on first landing. The parlor, dining-room and library are trimmed with quartered sycamore; the former is provided with an open fireplace, trimmed with tiles and a carved mantel. Dining-room has a paneled wainscoting and an entrance to porch. Kitchen and pantry are trimmed and wainscoted with North Carolina pine, and fitted up with the best modern conveniences. The second floor is trimmed with quartered sycamore, with the exception of one bedroom and one bathroom, which are finished with birdseye maple. This floor contains four bedrooms, two bathrooms and one servant's bedroom. Each bedroom is fitted up with good wardrobe closets and stationary bowls. Bathrooms are wainscoted, and furnished with porcelain fixtures and exposed nickel-plated plumbing.

Third floor is unfinished, but four good-sized bedrooms could be fitted up if desired. Cost $10,000 complete. Mr. George Morrow, architect, Salt Lake City, Utah.

Our engravings were made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.

A COUNTRY HOUSE AT POMPTON, N. J.

We present herewith in this issue on page 91 a very attractive country house, recently erected for E. Werner, Esq., at Pompton, N. J. The building is constructed on square lines, and is relieved by a spacious piazza. It presents a substantial appearance. The foundation is built of stone, and the underpinning of brick. The building above is constructed of wood, and the exterior is sheathed and then covered with clapboards, and painted a silver-gray color. Roof shingled, and painted red. Dimensions: Front, 52 ft.; side, 36 ft., not including piazza. Height of ceilings: Cellar, 7 ft.; first story, 9 ft. 6 in.; second story, 9 ft.; third story, 8 ft. 6 in. The interior throughout is trimmed with whitewood and finished natural. Hall, broad and spacious, contains a paneled seat, fireplace, and an ornamental staircase turned out of oak, and the latter is lighted by a cluster of stained glass windows. The fireplace is trimmed with a tiled hearth and facings, and a hardwood mantel. Parlor and library are separated by sliding doors, and each has open fireplaces, trimmed similar to the one already described. Dining-room is a well lighted apartment, and it contains fireplace, china closet, and butler's closet. Kitchen and laundry are wainscoted with narrow beaded stuff, and fitted up with the best modern conveniences. The second floor contains a large, open hall, four bedrooms, six closets, den, and bathroom, the latter furnished with exposed plumbing. The floors throughout are laid with yellow pine in narrow widths and oiled. There are four bedrooms on third floor, and ample storage. Cemented cellar contains furnace, laundry, and other necessary apartments. Cost $6,500 complete. Mr. Manly Cutter, architect, 203 Broadway, New York.

Our engraving was made direct from a photograph of the building, taken specially for the SCIENTIFIC AMERICAN.

PAINT upon window glass may be easily removed by rubbing with a cloth wet in hot strong vinegar.

CHRIST'S METHODIST EPISCOPAL CHURCH, PITTSBURG, PA.

We present on pages 81, 86, 87, engravings showing illustrations of Christ's M. E. Church, at Pittsburg, Pa. This church building marks an epoch in the history of church building, and is not only the finest among the many churches at Pittsburg, but is the most imposing church building from an architectural standpoint possessed by Methodism. The building is located at the junction of three streets, and is on a slight elevation, the natural advantage of which has been further enhanced by the treatment of the ample grounds, which are terraced, and so beautified as to form a proper setting for the grand edifice, without detracting from the magnificent proportions. The style of architecture is striking, and no other style would have presented an imposing and majestic appearance in this location. The style adopted is the Franco-Romanesque, which is the old Roman style, characterized, beautified, and fostered by central France, and nowhere is the peculiar style so strongly marked as in the peaceful city of Provence. The design is unique, and an innovation upon the styles and methods that have prevailed, while preserving the beautiful features and great solidity of ancient form. The motive of the general composition is the pyramidization of the whole mass to the crowning roof and tower. The exterior of the building is constructed of Cleveland (Ohio) sandstone. The roof is covered with Akron vitrified Spanish tiles, and finished with copper ridge and finials. The front of the church has a magnificent façade of 60 ft., and a width across transepts of 100 ft., while the total width, including chapel, is 130 ft., and the total depth, 170 ft. The central tower, 60 x 60, rises to a total height of 145 ft. The approach to the building from the street is by an easy flight of steps of good proportions. This is an essential feature so often wanting in American public buildings, which oftentimes have a tendency to render otherwise magnificent designs disappointing in execution. The main entrance vestibule is entered through three broad doorways, the enriched reveals of the semicircular arches of which are supported by groups of receding columns, thus giving great depth to the imposing entrances. One of the most unique and picturesque features of the building is the circular cloisters connecting the front and side vestibules. Great taste is displayed in the minute delicacy in the detail of all carving and modeling, all of which were executed from special designs. The changing from the square tower to the octagon is very successfully accomplished by breaching, the exposed angles terminating into octagonal minarets, thus effectively overcoming the otherwise great width of tower where observed diagonally, and thereby securing a perfectly proportioned tower from any point of view. The general plan is the Greek cross, and the huge crux tower, rising from the intersection of nave and transepts, is the church; all other parts are subordinate. Upon entering the main auditorium, one is struck with the magnificent proportions, the perfection in detail, and the harmony in decoration and furnishings. The lofty tower, or dome, pierced with twenty-four windows, floods the central portion with rich, mellow light. In the stained glass of each of the windows is designed a figure of an angel, of heroic size. The base of the dome, the great supporting arches, capitals, and chancel, are finished with an elaborately modeled frieze. The design of chancel is most excellent, the apsidal centre of which forms the choir loft, and is surmounted by a canopy, supported on a semicircle arcade. This is flanked on either side by the case and pipes of the organ. The choir stall is placed under the canopy, and the pulpit is in front of same, but at a lower level. The entire woodwork throughout the building is of quartered oak, darkened and finished in antique effect. The altar rail is supported by a massive bronze balustrade. The pulpit, chancel furniture, as well as the pews and screens, are of oak. The large nave window is filled with a finely executed memorial, representing the Redeemer preaching on the mount, and from designs by the Tiffany Glass Company. The other windows are of stained glass designed by Messrs. Edwin Ford and Fred Brooks. At the rear of the auditorium is the Sunday school room, with all its appliances and conveniences, arranged after the Akron model. At one side, and connected direct with the apartment, is a chapel, containing lecture room and pastor's study. This room, while connected with the Sunday school room, can be separated, if desired. It is provided with an open timbered ceiling, and is so arranged in connection with the suitable apartments in the basement as to provide all the necessary social accommodations. At the extreme end is located the church office, which is provided with toilet and vault. The acoustics, that property so essential to all buildings for public assemblages, and without which the best designed and planned are failures, have been successfully secured. Under the chapel is located a steel plate fan, from which is introduced fresh, pure air, passing over the steam heating coils, and through conduits to the various parts of the building. By means of a novel device, this air is cleaned of dirt and dust before passing into the fan. The fan is propelled by a steam engine. The air is heated in its passage over the steam coils. A by-pass is also provided, so that a part or the whole of the fresh air can pass into the church without heating, or it can be mixed to any temperature desired. Steam is supplied by a battery of two forty-pound steel tubular boilers, located in a room adjacent to the heating apparatus. Every modern feature has been adopted, and the fresh warm air is introduced into the auditorium through registers in the walls, and also through registers in the end of a large number of pews. Ample warm air is supplied in vestibules and at entrances to prevent cold draughts. This combination of large volume supplies and small seat registers is for the purpose of securing a proper flow and distribution. Proper outlets and flues are provided for the passage of foul air from the various apartments. This apparatus, at a moderate speed of fan and engine, delivers a sufficient volume to effect a complete change of air in the entire church, and all its parts, every ten minutes, there being introduced 2,880,000 cubic feet per hour, and a uniform temperature of 70° in coldest weather. The electric lighting is also of the most improved kind. The building was planned, designed and executed under the personal supervision of Mr. George W. Kramer, of Geo. W. Kramer & Co., church architects, No. 1 Madison Avenue, New York.

Our engravings were made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.

A MODERN DWELLING HOUSE.

We present on page 85 a modern dwelling house, which has recently been erected for W. R. Brown, Esq., at Chestnut Street, Binghamton, N. Y. The design is admirable, and it is treated in the American style with a combination of Queen Anne outlines and Colonial details. The underpinning is built of rock-faced bluestone. The framework is sheathed on the exterior, and then clapboarded on first story, and painted a reddish brown, with cream white trimmings; second and third stories are shingled, and finished natural, with similar trimmings. Blinds are painted bottle green. The roof is shingled and stained a dark brown. Dimensions: Front, 34 ft. 6 in.; side, 48 ft., exclusive of piazza. Height of ceilings: Cellar, 7 ft.; first story, 9 ft. 6 in.; second, 9 ft.; third, 8 ft. 6 in. The hall is a handsome one, with a colonnade effect. It is trimmed with oak, and is provided with a paneled wainscoting. The separation between this hall and library is formed of columns extending to ceiling, with carved capitals and spindlework. The staircase is an ornamental one, with newel posts, rail, and balusters. There is a cluster of windows on first landing, glazed with delicate stained glass, which sheds a soft and pleasant light over upper and lower halls. The lobby is trimmed similar to hall. The floors are laid with hard pine. The parlor is treated with white and gold in a dainty manner. Library is trimmed with oak, and it contains an open fireplace, built of brick, with tiled hearth and facings, and a hardwood mantel, with columns and mirrors. Dining-room is trimmed with cherry, and is provided with a large butler's closet, fitted up with shelves inclosed with glass doors, cupboards, and drawers. Kitchen is trimmed and wainscoted with yellow pine, and is furnished with the best modern improvements. The second floor is trimmed with white pine, and treated in colors; it contains four bedrooms, large closets, and bathroom. Bathroom is trimmed and wainscoted with cherry, and it is furnished with the usual fixtures and exposed plumbing. Third floor contains two bedrooms and ample storage. Cemented cellar contains furnace, laundry, and other necessary apartments. Cost $3,800 complete. Mr. S. O. Lacey, architect, Phelps Bank Building, Binghamton, N. Y.

Our engravings were made direct from photographs of the building, taken specially for the SCIENTIFIC AMERICAN.

A Brief Historical Sketch of the Origin of the Library.

It may be of interest to our readers to give a brief historical sketch of library. It is derived from the Latin *librarium*. The first known library was founded at Thebes, in the fourteenth century B. C., and it originated from the bark of a tree, that being the earliest writing material. Papyrus manuscript, which is assigned to the year 1600 B. C., is a fabric perfect as to print to a much earlier invention. With this invention came the age of books. This plant, from which the ancients made paper, may be found growing upon the banks of the Nile, the Jordan, and in the south of Italy. It has an underground stem, sending up at intervals ordinary stems eight to ten feet in height, from which the paper is made from thin slices cut vertically. Rolls of papyrus with writings upon them constituted an ancient book. Pisistratus founded a public library at Athens, about 540 B. C. Strabo says that the first private library was that of Aristotle, B. C. 334. The celebrated Alexandrian library was founded about 298 B. C.; it was partially destroyed by fire in the Egyptian contest carried on by Julius Caesar, 47 B. C.

Coming down to the modern libraries, we have the Bibliothèque Nationale at Paris, which is the largest and most extensive library in the world, containing 2,370,000 volumes and pamphlets; and the British Museum Library (1,550,000 volumes and 50,000 manuscripts), which far excels the former institution in its systematic arrangement of its books and its accessibility to its contents, and, although recent changes have somewhat limited its former character, it still remains the grand national repository of literature.

The library of the Vatican, at Rome, ranks among the most valuable of the European libraries. In the United States, where intelligence and education is so important, will be found the Government Library, at Washington, for which a magnificent building has been erected, which promises before many years to equal the great European libraries in importance. The Boston Library has 600,000 volumes; the Columbia College Library contains the finest collection of architectural works, and the consolidation of the Astor and Lenox Libraries will take rank at the head of all the libraries we possess on this side of the water.

Boston's $3,000,000 Hotel.

Advices from Boston state that the largest hotel structure in the world is to be erected in that city during the coming year. A company, of which the Hon. Charles Francis Adams is the president, has just purchased the grounds for this remarkable building, accepted the plans, and adopted the name of "The Commonwealth." It will be erected on Commonwealth avenue, between Ashby and Chilmark streets, and its total cost will be something over $3,000,000.

The building will be eleven stories high, but owing to its well-proportioned lines it will not have the appearance of being extremely tall. It will be built of fancy buff brick and terra-cotta, and in effect will be something like the Charlesgate. The design is after that of the palace of the Duke of Mecklenburg-Schwerin, in the north of Germany. The hotel will be in three sections, each one containing more than 700 rooms, and making a total of 2,250 separate apartments.

The plans provide for an open court between each section of the house seventy feet wide, and giving ample light to the room facing it. Then in each section there will be an interior court thirty-five feet square. The dining-room is to be on the north side, next to the river, a handsome one-story structure, divided by an ingenious arrangement of lines into a number of cozy, half shut-in apartments. The suits will be of various sizes, and each will have the advantage of a double elevator service, one set of elevators being for passengers and the other for freight. There will be twenty-one elevator wells in the building.

The hotel is to have one of the most beautiful banquet halls in this country, and a magnificent ballroom as well. In addition to this, it will have an ice skating rink, which will be used in summer as a bicycle pavilion. There will be an elaborate refrigerating apparatus in the hotel, and this will be used to make ice for the skating rink, as well as keeping provisions.—*Industrial World.*

A Pink Marble Bridge.

A new bridge to be erected over the Tennessee River, at Knoxville, while not to be of unusual size, will be, the engineer in charge says, a wonder in the engineering and architectural world, says the Boston *Journal of Chemistry*. It is to be built entirely of pink marble, quarried in Knox County and within a few miles of the site. It will be 1,600 feet long from "out to out" of abutments, and will be 240 feet long in the main spans of arch, which, it is claimed, is twenty feet longer than the longest arch in the world. It will rise at the crown of the channel spans, 105 feet above the water, making it a decidedly imposing structure. It will be a solid marble bridge from side to side, with a fifty foot roadway, over 100 feet above water, with the four largest spans in the world. The immense arches will be eight feet deep at the keystone, fifteen at the skewbacks or spring lines, and will spring from piers thirty feet high and forty feet wide. The piers go to solid rock, the substructure limestone, twelve feet below the water surface at the bridge site. The arches and spandrel filling will be constructed of concrete. The parapet walls will be constructed of sawed marble slabs, with heavy blocks on pilasters every fifteen feet, projecting above the wall proper, and giving what might be called a semi-castellated effect.

THE Chamber of Deputies and the Municipal Council of Paris are likely, between them, to reduce the Paris Exposition of 1900 to such proportions that it will cover less space and have less magnificence than that of 1889.

The former body has imposed three restrictions: First, that no part of the Champs Elysées shall be used for the Exhibition; second, that the Palais de l'Industrie shall not be rebuilt or removed; third, that none of the new buildings shall be put up on the right bank of the Seine.

A COMPETITION of criticism is being held by the Philadelphia T-Square Club. The competitors are to name the five most inappropriate structures in Philadelphia, and, taking the worst example, they are to show how upon the same plan they would treat the building so as to produce an appropriate and pleasing effect.

To remove the finger marks from varnished furniture rub them with a cloth dampened with sweet oil. To remove them from oiled furniture, use kerosene oil.

AN IMPROVED SCROLL SAW.

We herewith illustrate a machine especially designed for carpenters, builders, cabinetmakers, and general workshop use. It is thoroughly practical strong, and durable, will cut up to three inches thick, and swing twenty-four inches. It is manufactured by the Seneca Falls Manufacturing Company, 276 Water Street, Seneca Falls, N. Y. It has wooden arms pivoted in such a manner as to prevent any side motion, and in connection with the self-adjusting saw clamps giving a straight up and-down motion to the saw blade. It is designed to use 8-inch saw blades, but can be adjusted to use 5-inch blades, if desired, for very light work. It is fitted with an iron tilting table, turned true and polished, which can be adjusted to any angle for sawing inlaid work. It has an adjustable upright drilling attachment, provided with an "Empire" drill chuck, which will hold twist drills from No. 60 to 3-16 inch inclusive. The foot power has a walking motion, enabling the operator to run the machine with both feet sitting, or with one foot standing, as he may prefer. The average rate of speed when sawing is about 800 strokes per minute. Height from floor to top of table is forty inches. For steam power, tight and loose pulleys are furnished, arranged to connect with the driving wheel shaft. Weight of machine, 165 pounds.

THE "EMPIRE" SCROLL SAW.

A NEW RECORDING THERMOMETER FOR ATMOSPHERIC RANGES OF TEMPERATURE.

The novel and especially valuable feature of the recording thermometer herein described is that the recording portion may be located at a distance of twenty-five or thirty feet from the point at which the temperature is to be measured.

This makes it possible to obtain a continuous record of the outside temperature while the recorder is located at a convenient point within doors where it may be readily observed, and its mechanism is not exposed to the detrimental influences of inclement weather. For cold storage plants where closed rooms are to be maintained at a constant temperature for the preservation of meats, fruits, and vegetables, an instrument of this kind is of great value, as the temperature may be observed without opening the doors.

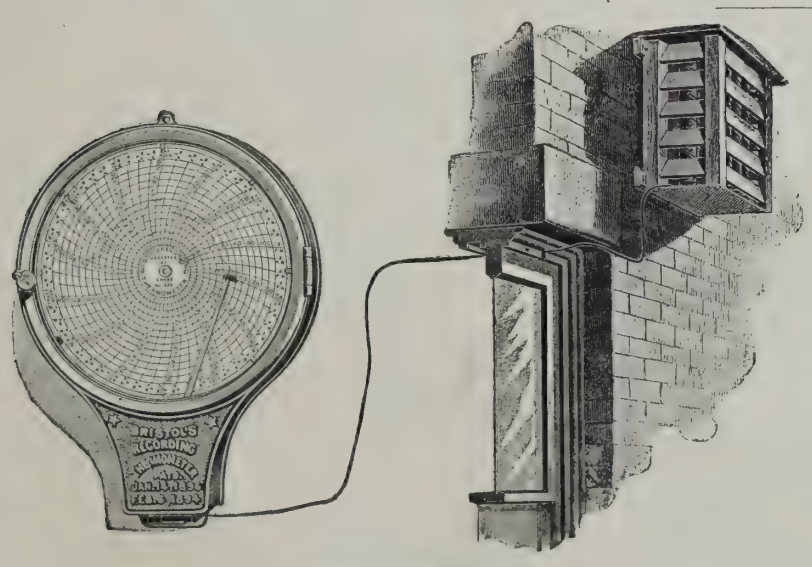
The recording part (Fig. 1) is an application of one of Bristol's recording pressure gauges.

The bulb portion (Fig. 2) is placed at the point where temperature is to be measured. It consists of a series of helical tubes constructed on the same principle as that in the recorder. The helical coils are suspended in a vertical position, with their lower ends free, the upper ends opening into the capillary tube connecting them with the recorder.

The system of helical tubes forming the bulb portion, the pressure tube of the recorder, and the capillary connecting tube are completely filled with alcohol under pressure, and permanently sealed. As the temperature rises and falls where the bulb is located, there is a corresponding expansion or contraction of the alcohol, which is communicated to the recorder and registered on a seven-day chart, graduated to read in degrees Fahrenheit.

Excessive pressures, due to increased volume of the non-compressible liquid, are provided against by the expansible form of the system of helical tubes of which the bulb is constructed. The total volume of the bulb portion is very large as compared with that in the pressure recorder, thus avoiding the necessity of compensating for ordinary changes of temperature in the room where the recorder is located. No correction is required for barometric changes, as only high ranges of pressure are employed.

This thermometer is being manufactured by the Bristol Company, of Waterbury, Conn. One of the instruments may be seen in operation recording the outside temperature at their New York branch office at 121 Liberty Street. The recorder is placed in the show window, where it may be observed from the sidewalk.



A NEW RECORDING THERMOMETER.

IN these days when the carpet would seem to be giving way to the polished floor, the question of providing a good oil for the purpose is an important one. The beeswax oil manufactured by James Gresham, 192 to 200 Seventh Street, Brooklyn, N. Y., is a preparation whose proportions, etc., have been the subject of long experiment. It has the great advantage of not merely preserving the substance of the flooring material, but of bringing out again the natural beauty of the grain, where it has faded from constant exposure. Yellow pine, pitch pine and all the highly resinous woods turn gray with age, and the grain in time becomes rough, standing up in relief above the surface. The beeswax oil has the property of sinking deeply into the substance of the wood, and restoring the smoothness, as well as the beauty, of grain of the original plank. It thus tends to bind together the fibres, and prevents splitting and splintering. The manufacturers of this oil have succeeded in overcoming the tendency of all such materials to dry out of the wood in the course of time, and they have produced an oil which keeps its freshness, and does not fade under the action of soap. It is easily applied, a woolen rag being sufficient for the purpose, and it is very effective as a cleaner of furniture, drying rapidly and producing a fine gloss. By closing up the crevices in the wood it prevents the lodgment of lint or insects, and conduces to the cleanliness of the floor.

HARDWOOD FLOORS, making and finishing them, and afterwards caring for them, so that they will last long and always look well, are treated of in great detail in two neat pamphlets, by S. C. Johnson, a manufacturer of parquet floors, at Racine, Wis. Those interested should write for these pamphlets, and also for the catalogue on parquet flooring. The business was established by Mr. Johnson in 18?2, and a large and finely equipped factory is now employed in making these floors.

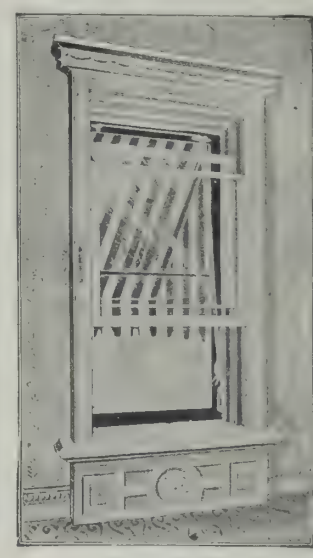
THE Twentieth Annual Catalogue, for 1896, of the Canton Steel Roofing Company, affords a handsome representation of the continued prosperity of the company, and a most interesting exhibit of a very extensive line of sheet metal goods. These designs, besides much that is new in roofings and fronts, include new designs in ornamental steel ceilings, ventilators, chimney tops, weather vanes, crestings, caps, finials, cornice pediments, etc. Architects and builders should send for a catalogue.

A SERIOUS landslide is said to have taken place at Trub, about twenty miles east of Berne, Switzerland. A landslide is also reported to have taken place at Bondesir, Saguenay County, Province of Quebec, Canada.

IMPROVED SCREENS AND AWNINGS.

The Phenix Manufacturing Company, of Milwaukee, Wis., in their invention of the Phenix hanger, provided a most useful practical device for hanging storm sash and entire screens, which has become very popular in a short time. With this hanger, entire screens or storm sash can be easily hung or removed at any time, by any person, from the inside of a room. The same company now have a further patented improvement, comprising a combined window screen and awning, as shown in the accompanying illustration. The awning is attached directly to the screen sash, and is operated from inside the building, by a cord and patent pulleys, running through the screen sash. By means of this combined device, the awning and screen are readily put up or removed from inside, stored in about the same space required for the screen alone, and when again needed will be ready for instant use and replacement, without the need of expert labor. Both sun and flies are thus avoided, and perfect ventilation is obtained.

ENTIRE SCREEN OR STORM SASH.



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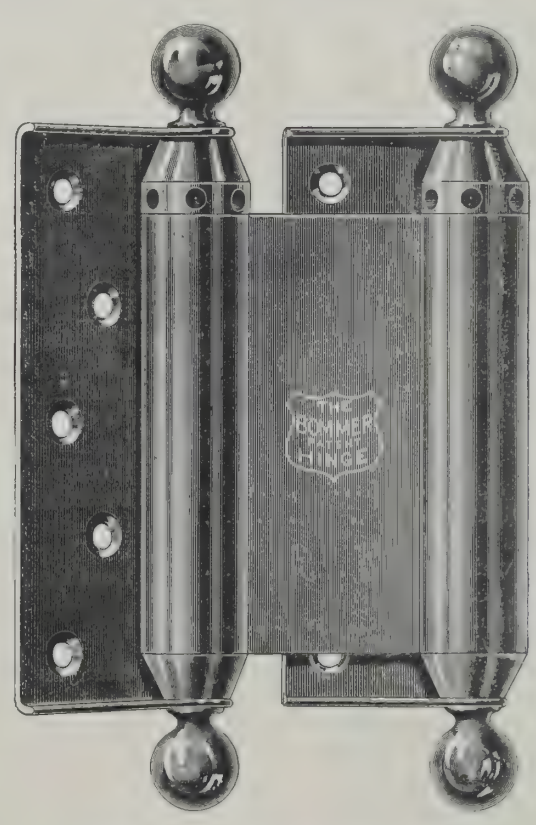

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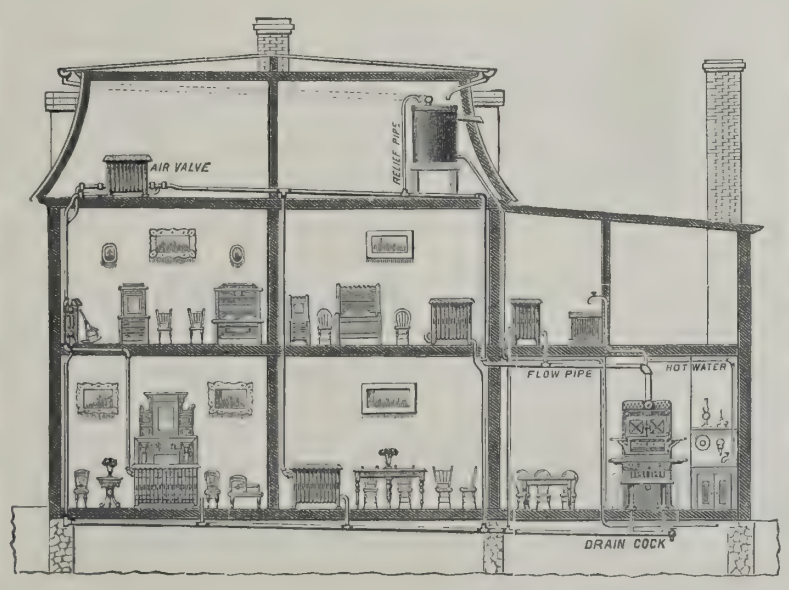

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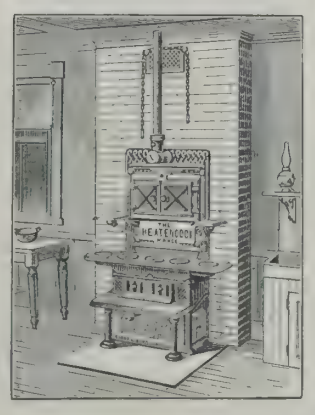

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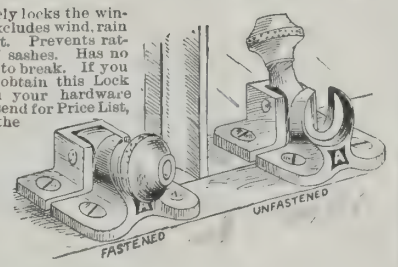

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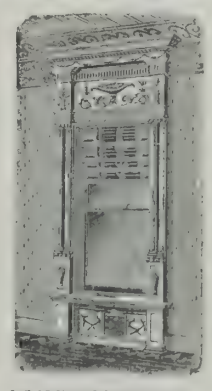

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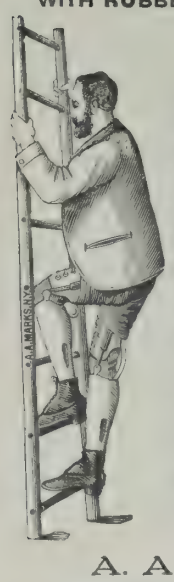

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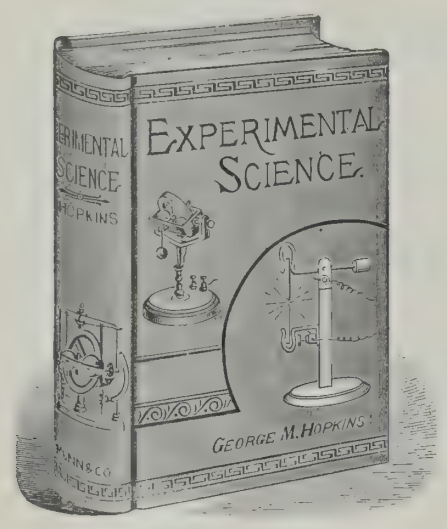

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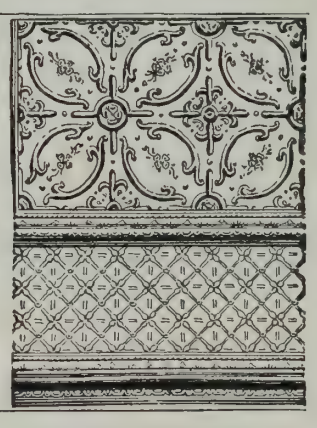

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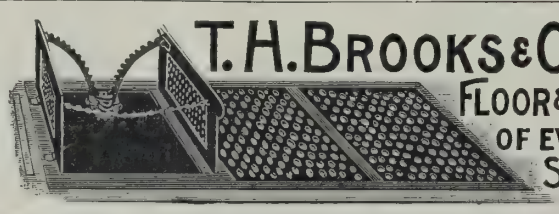

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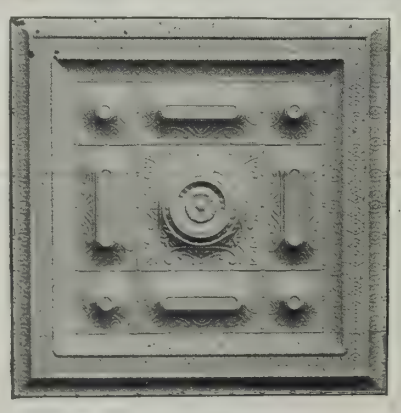

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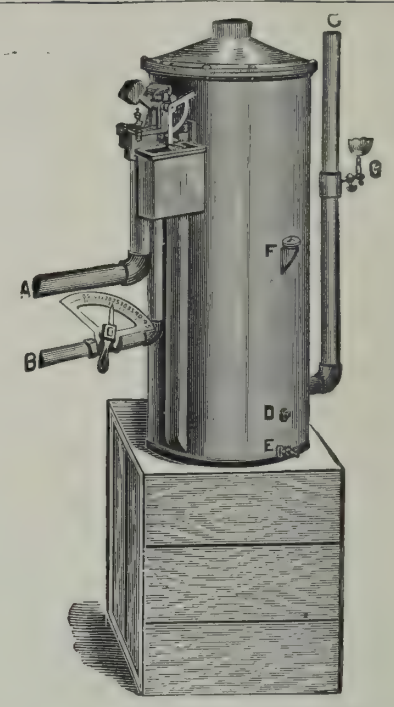

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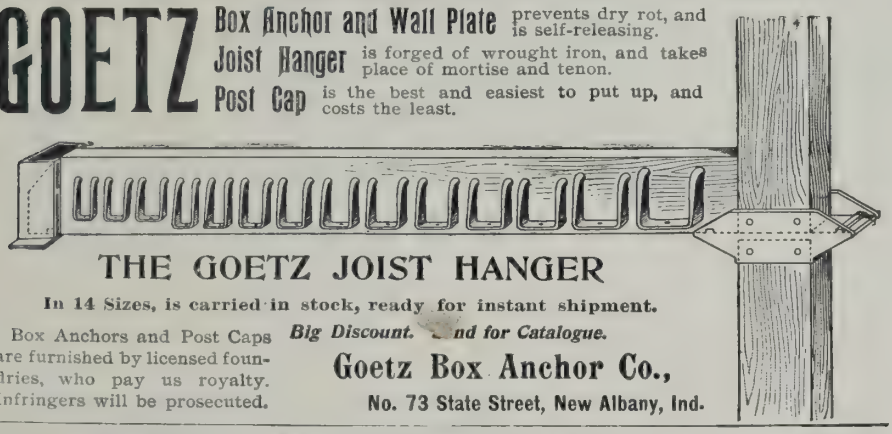

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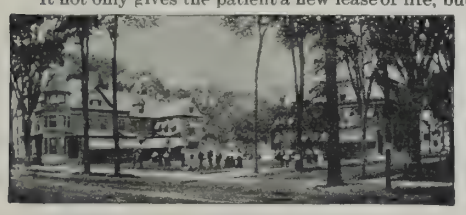

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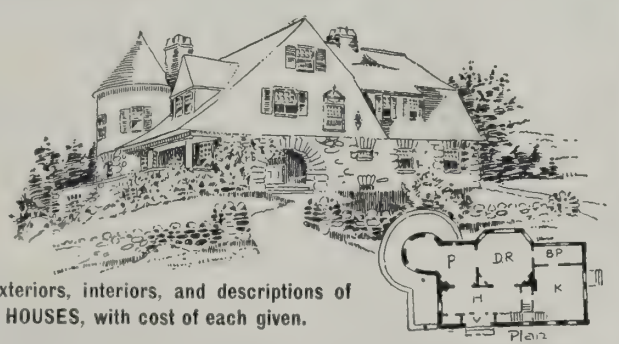

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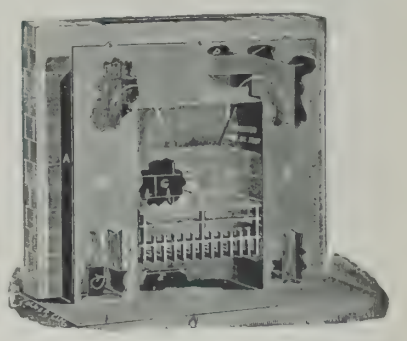

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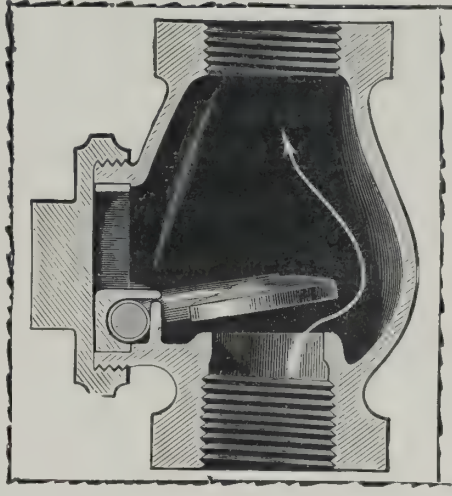

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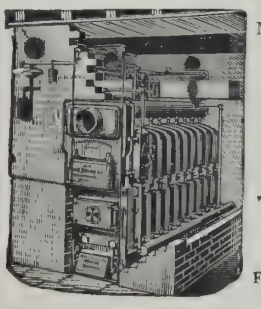

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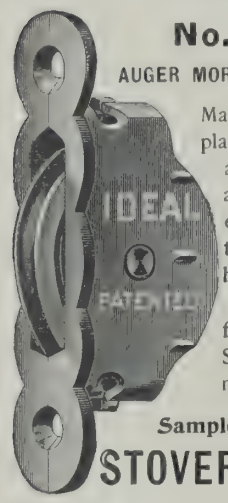

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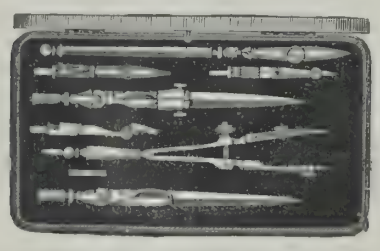

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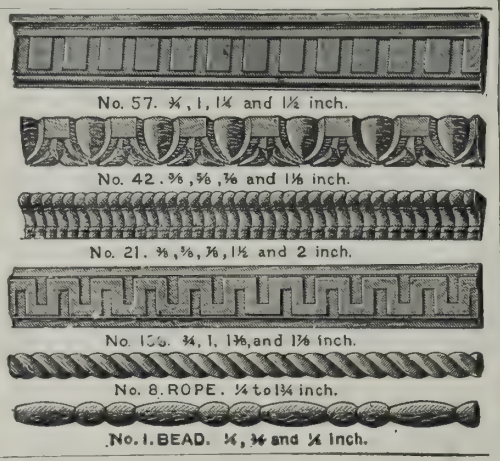
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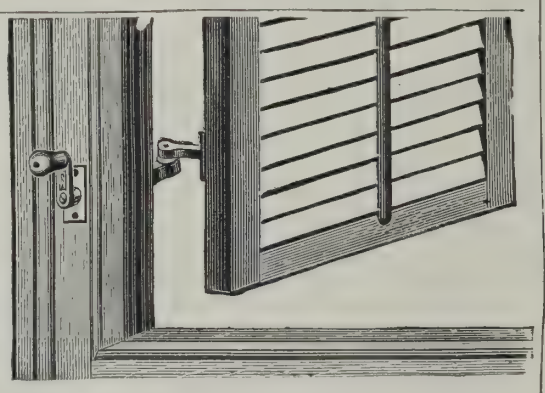

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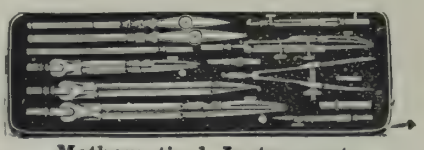

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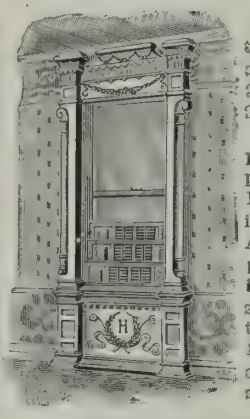

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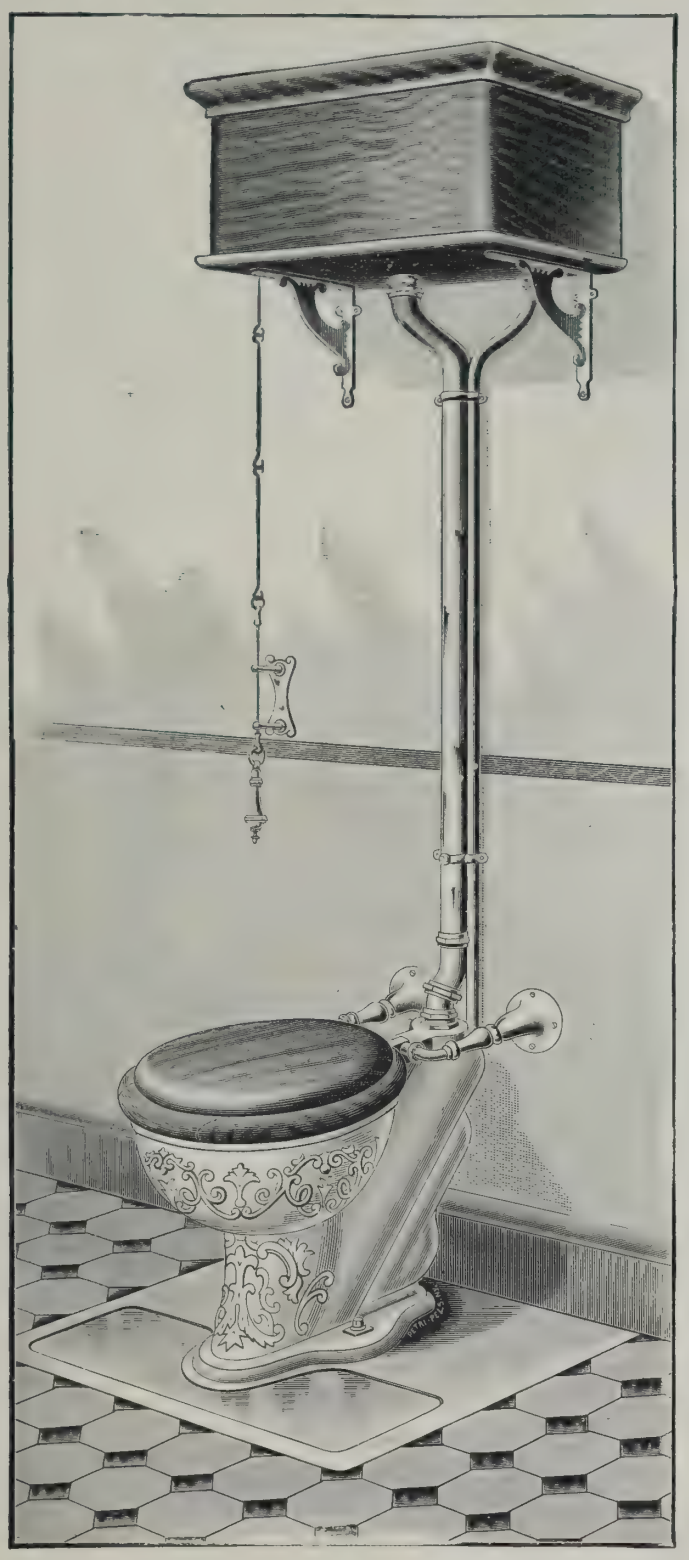

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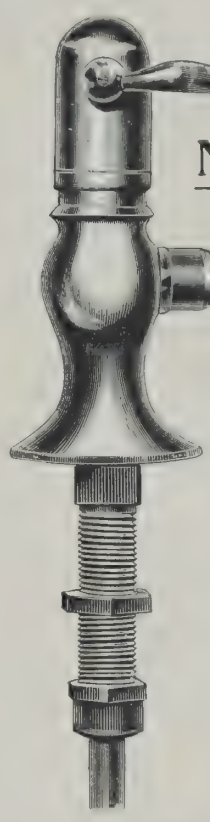

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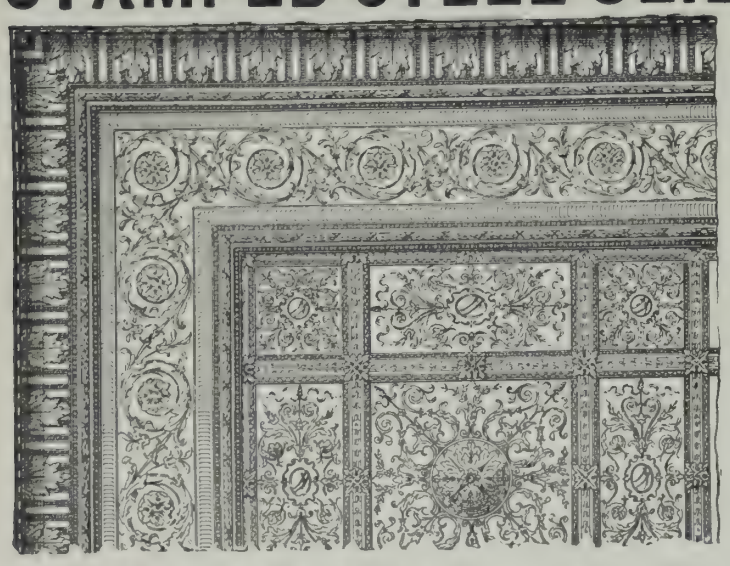

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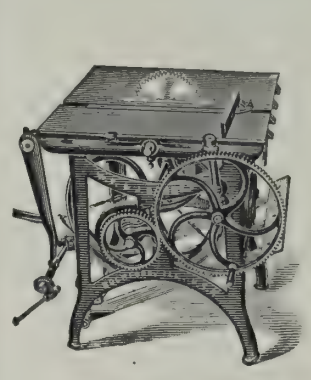

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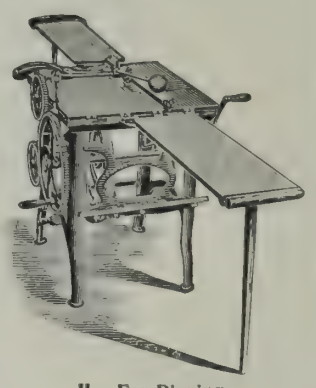

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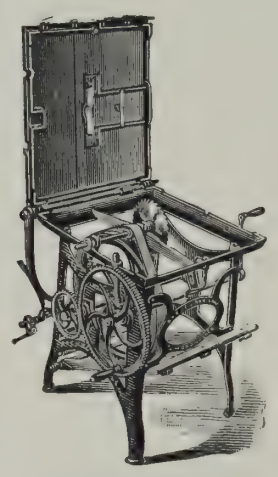

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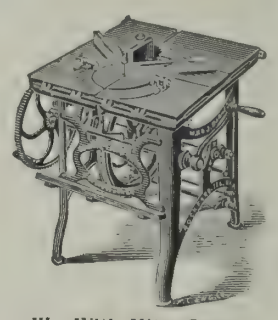

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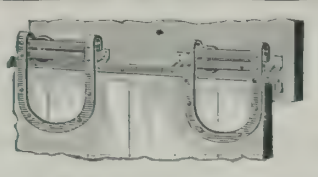

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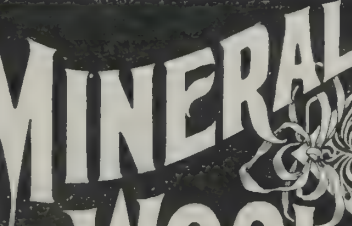
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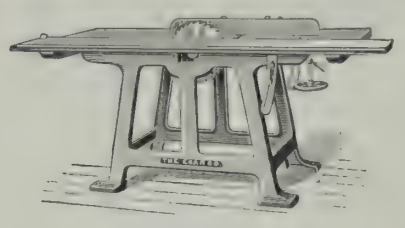

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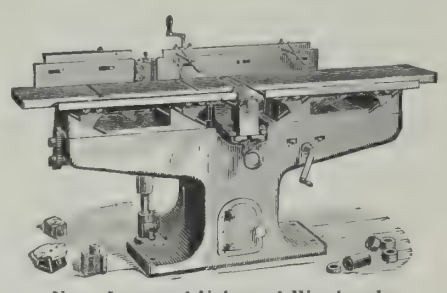

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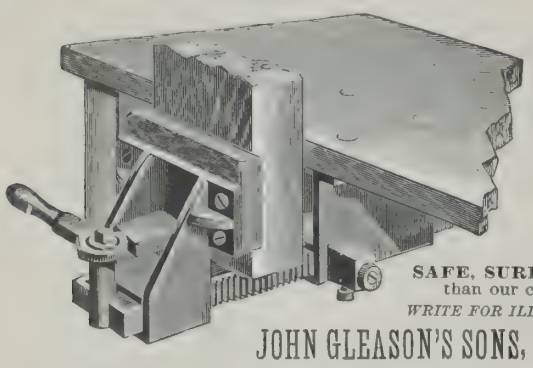

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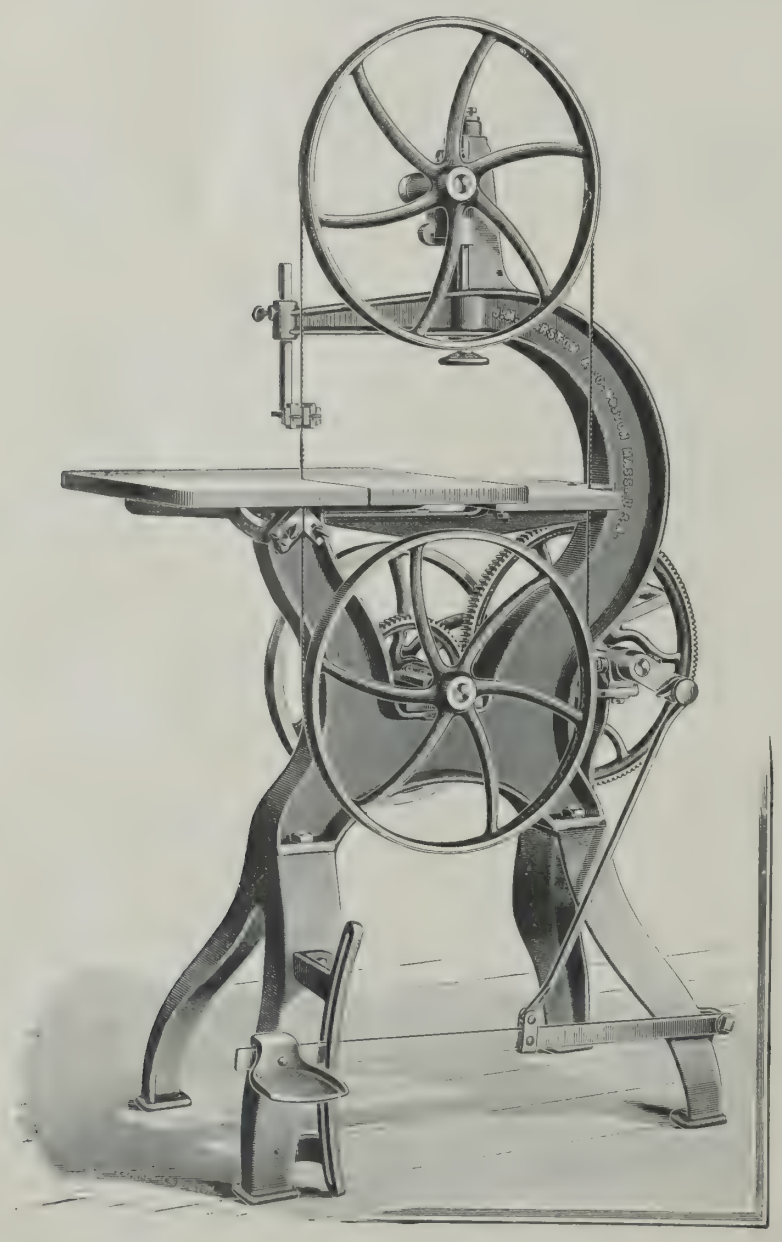

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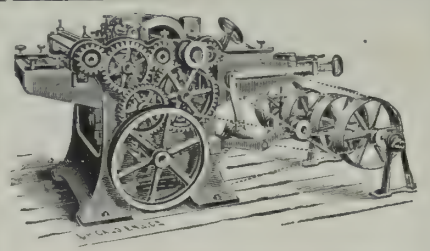

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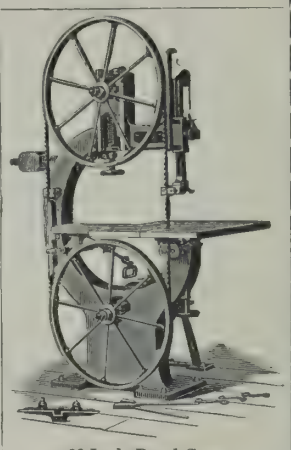

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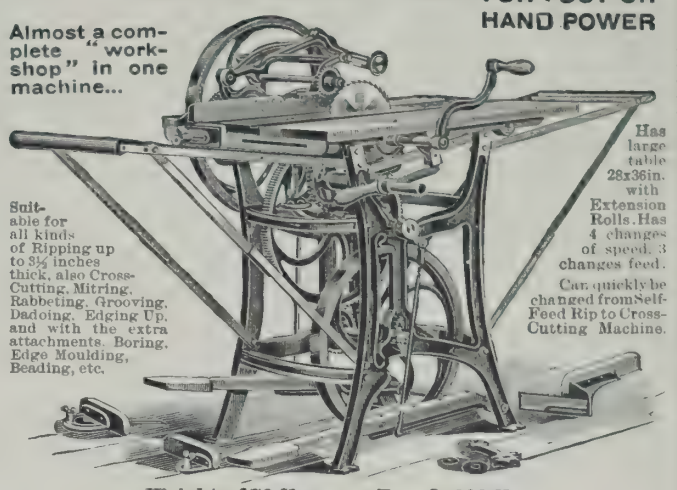
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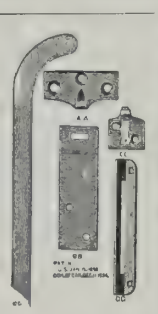

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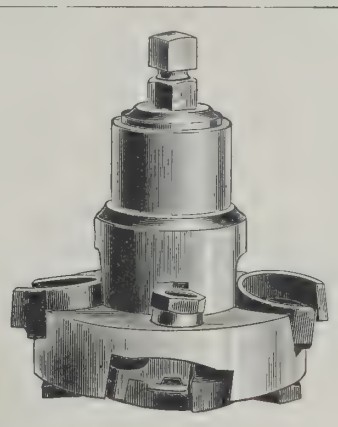

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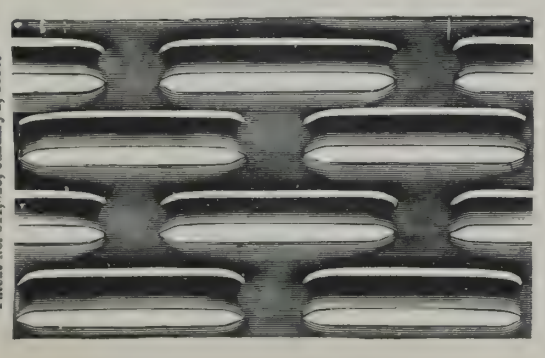

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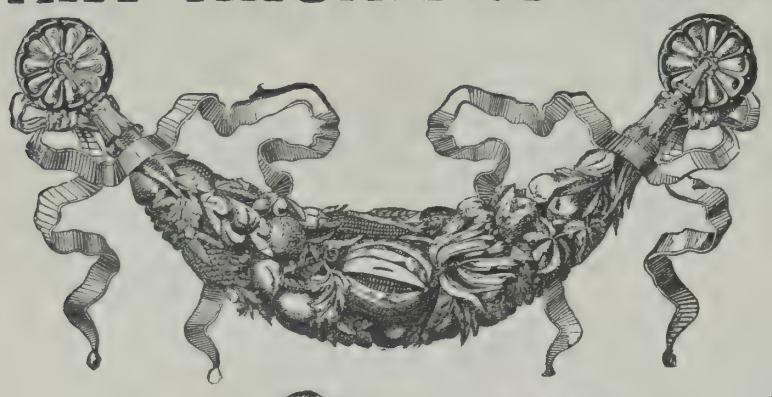

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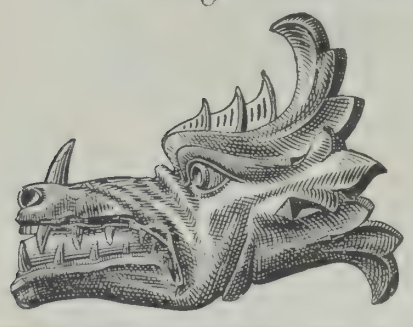

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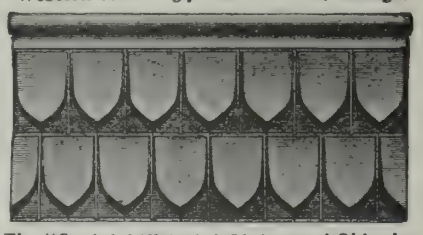

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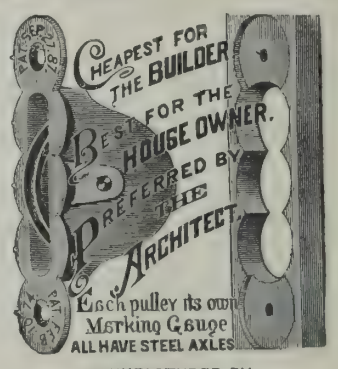
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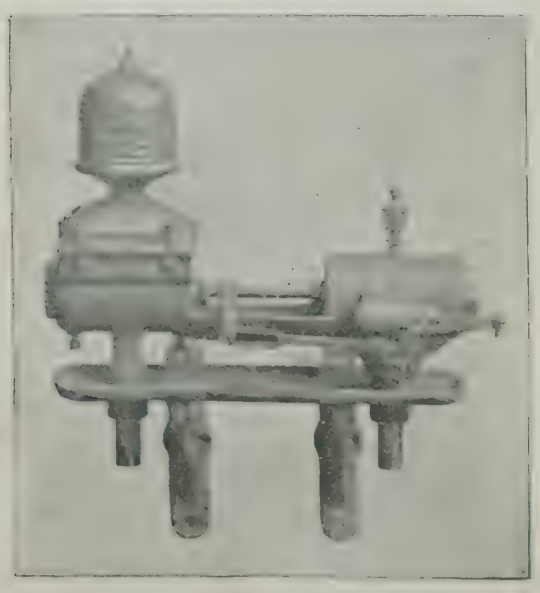

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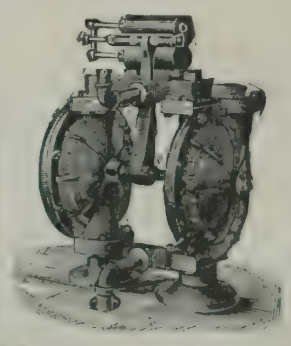

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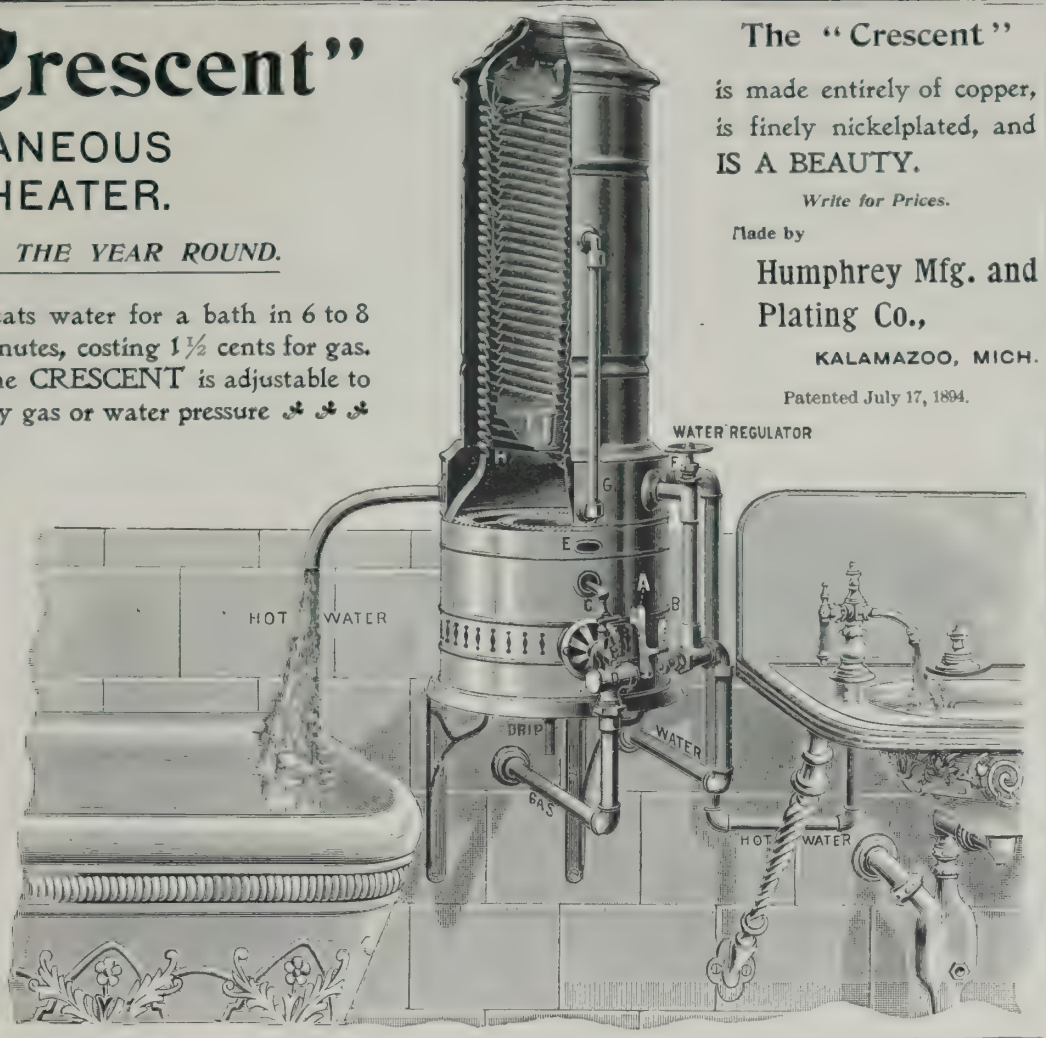

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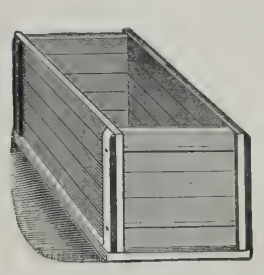

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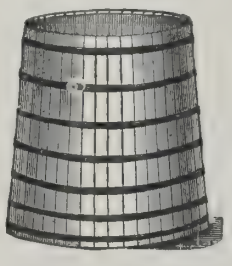

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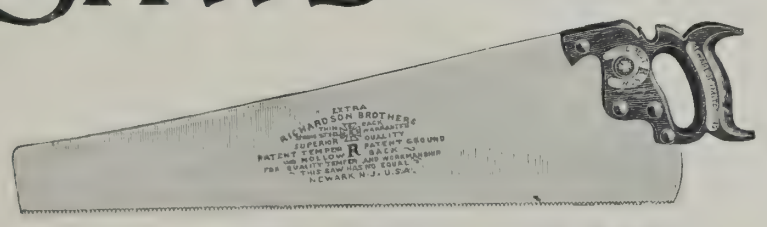

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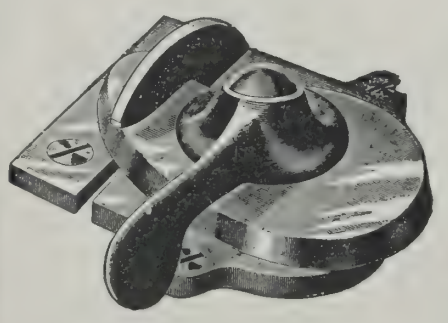

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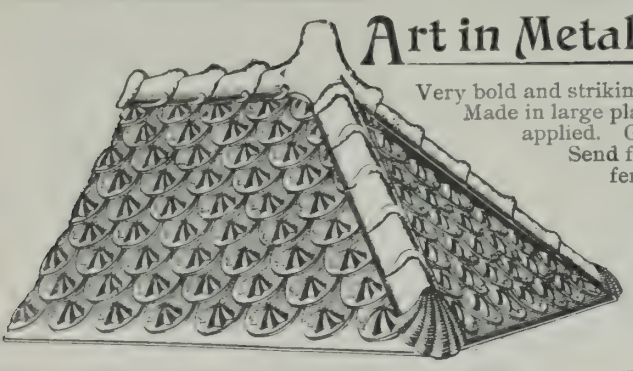

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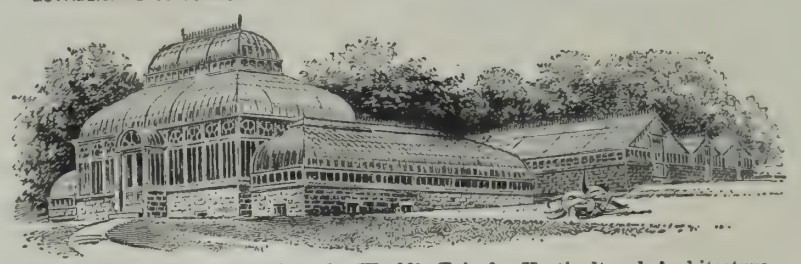

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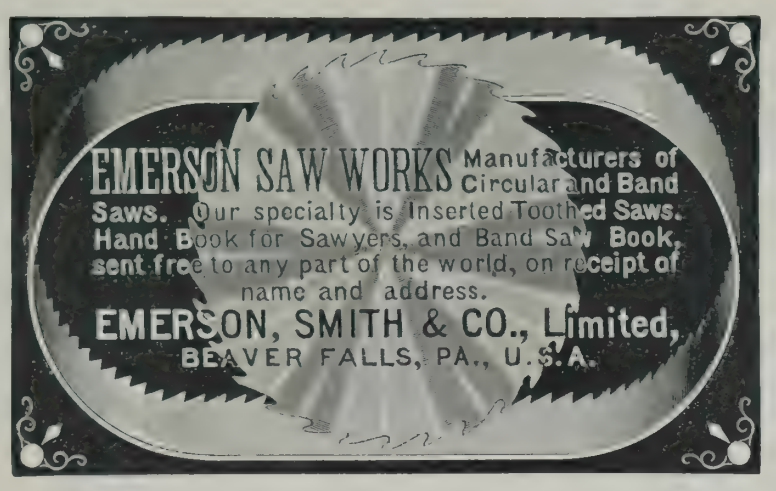
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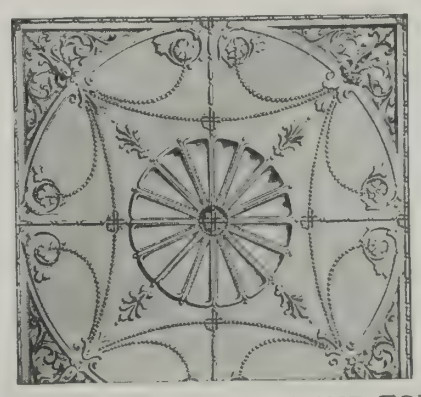

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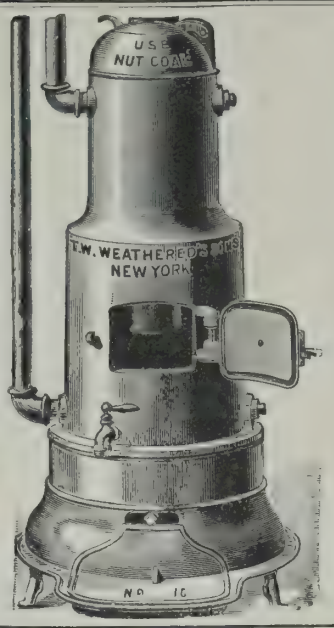

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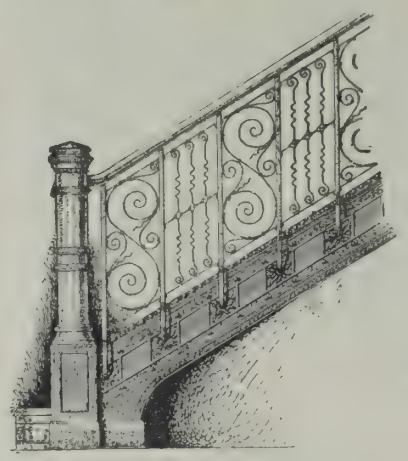

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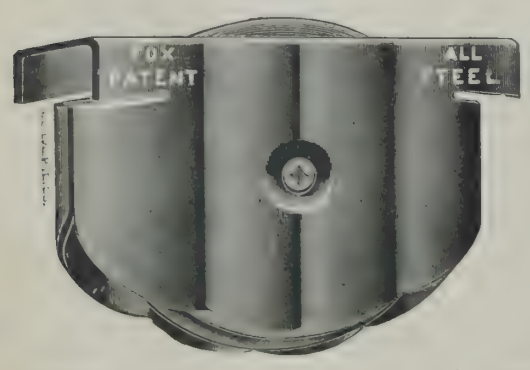

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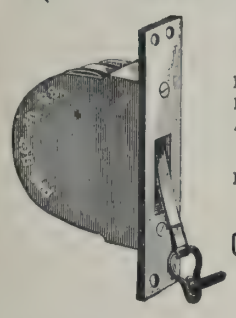

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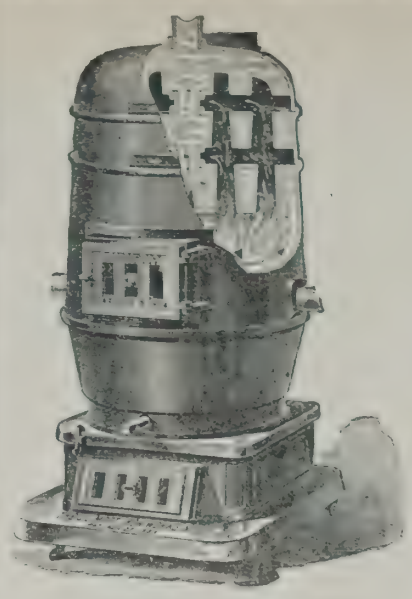

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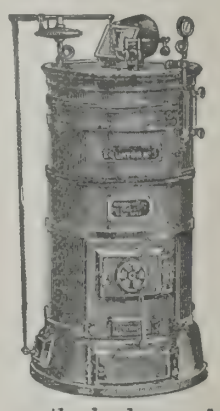

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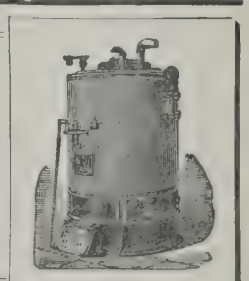

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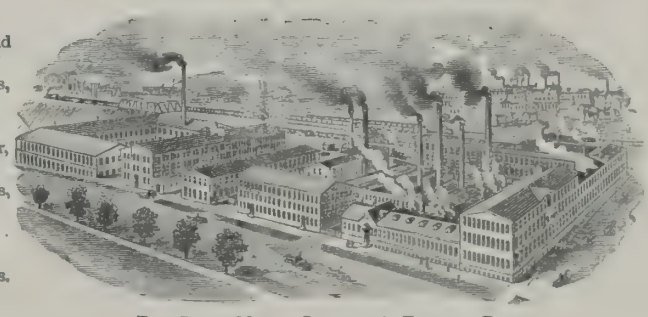

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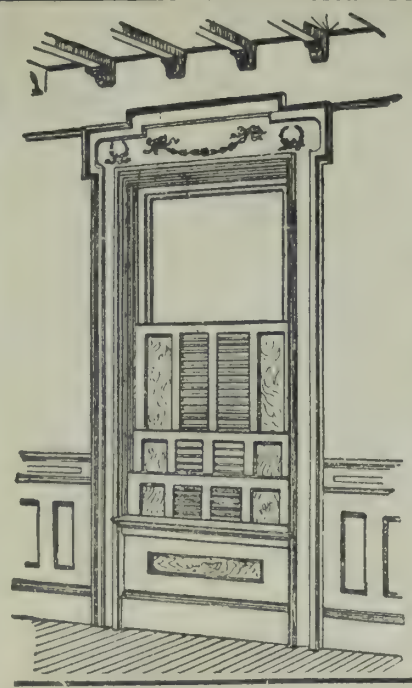

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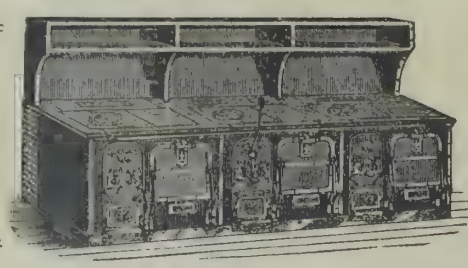

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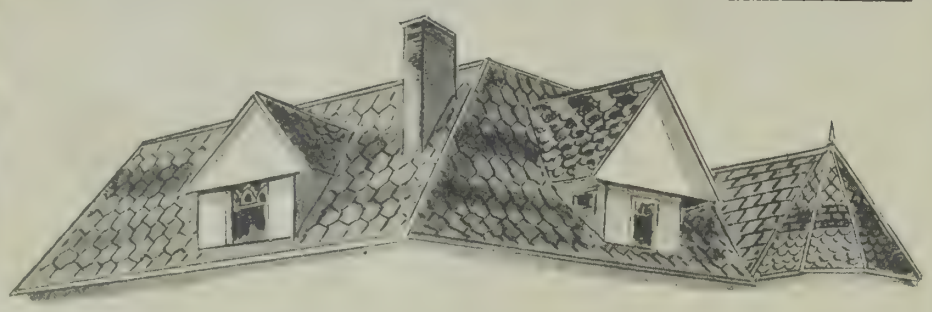

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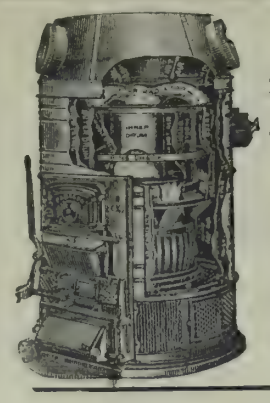

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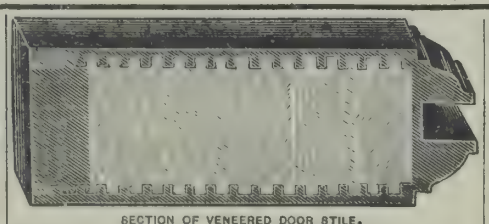

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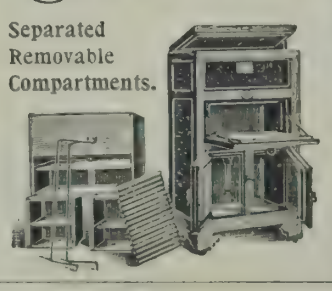

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